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UNITED STATES STRATEGIC MINERAL POLICY

I. INTRODUCTION

The United States is dependent on foreign sources for many of its strategic minerals.¹ In 1985, for example, this country imported more than ninety percent of its columbium, manganese, mica, strontium, bauxite, cobalt, tantalum and platinum group metals.² Historically, the United States has relied on several politically unstable or repressive regimes for some of these strategic mineral supplies. For example, in the early part of this decade, the Republic of South Africa was the dominant source of American imports of chromium, manganese and platinum group metals.³ The United States also imported much of its cobalt from Zaire during the 1980's.⁴ During this same period, Chile was this country's largest copper supplier.⁵ Despite abusive human rights practices⁶ in these mineral-rich countries, the United States has continued to import their minerals, and thus support them economically, while offering only token signals of disapproval of these countries' human rights abuses. Consequently, the United States has compromised its national security by depending on foreign nations for its mineral supply, and has in turn compromised foreign policy by supporting repressive regimes.⁷

Unfortunately, the United States has been unable to reduce its dependence on foreign sources of strategic minerals because many minerals are produced by just a few countries, thus restricting our government's options.⁸ During the past fifty years, Congress has enacted several stat-

1. Strategic minerals are defined as minerals " 'for which the quantity required for essential military and civilian uses with no available economic substitutes exceeds the reasonably secure domestic and foreign sources of supply.' " B. DICKERSON & C. O'BRIEN, OTA REPORT, EXPLORATION FOR STRATEGIC MATERIALS at 1 (no date) (Office of Technology Assessment Working Paper) (quoting Office of Technology Assessment's definition) (Cong. Info. Serv. (CIS) J952-56 1985).

2. See U.S. DEPT. OF THE INTERIOR, BUREAU OF MINES, MINERAL COMMODITY SUMMARIES 1986 2 (1986) [hereinafter MINERAL COMMODITY SUMMARIES 1986]. For uses of selected strategic minerals, see *infra* note 10.

3. MINERAL COMMODITY SUMMARIES 1986, *supra* note 2, at 34, 98, 118.

4. *Id.* at 38.

5. *Id.* at 42.

6. See *infra* notes 252-56 and accompanying text.

7. See *infra* notes 214-23 and accompanying text for a discussion of how U.S. dependence on other countries for its strategic minerals has affected our national security. For a discussion of U.S. foreign policy and strategic mineral vulnerability, see *infra* notes 224-60 and accompanying text.

8. South Africa possesses approximately 84% of the world's known resources in shipping grade chromium, 71% of the world's identified land-based manganese resources and 81% of

utes that have attempted to deal with our mineral dependency. Generally, however, these legislative efforts have been ineffective. As a result, the lack of an effective strategic mineral policy has left the United States dangerously dependent on a handful of countries for several essential minerals.

This Comment will examine the United States' dependence on strategic minerals, the goals of our government's present strategic mineral policy and determine whether those goals have been met. The Comment will then present a number of proposals which would properly balance the United States' need to import strategic minerals against other potentially conflicting national policy concerns.

II. AMERICAN DEPENDENCE ON STRATEGIC MINERALS

The United States imports more than thirty-three strategic minerals from other countries. Thirteen are essential to the national economy, and their supply is severely limited and vulnerable to interruption.⁹ Cobalt, chromium, manganese and platinum group metals are considered "first tier" minerals because of their importance to the U.S. economy.¹⁰ The United States needs "first tier" minerals for both military¹¹ and civilian uses.¹² While the United States must import nearly all of its "first

the world's known platinum group metals resources. Zaire, Cuba and the USSR control approximately one half of the world's known reserves of cobalt. See generally MINERAL COMMODITY SUMMARIES 1986, *supra* note 2.

9. CONG. OF THE UNITED STATES, OFFICE OF TECHNOLOGY ASSESSMENT, STRATEGIC MATERIALS: TECHNOLOGIES TO REDUCE U.S. IMPORT VULNERABILITY 11 (1985) (CIS J952-27 1985) [hereinafter OTA REPORT].

10. *Id.* Chromium is used in the production of stainless steel, superalloys and as a chemical in pigments, metal treatments and leather tanning. *Id.* at 12-13. Platinum group metals are used for catalytic applications in petroleum refining, chemical processing and automotive exhaust treatment. *Id.* Cobalt is a critical additive in various superalloys, a binder for tungsten carbide tools, a catalyst in petroleum refining and chemical manufacturing and a pigment used in paints. *Id.* at 13. Manganese is used as an alloy in steel and other metals, and in the manufacture of batteries and chemicals. *Id.*

11. In the late 1970's, the mineral requirements for the F 100 turbofan jet fighter engine included 5366 pounds of titanium, 5204 pounds of nickel, 1656 pounds of chromium, 910 pounds of cobalt, 720 pounds of aluminum, 171 pounds of columbium and 3 pounds of tantalum. SUBCOMM. ON MINES AND MINING, COMM. ON INTERIOR AND INSULAR AFFAIRS, H.R., 96TH CONG., 2D SESS., U.S. MINERALS VULNERABILITY: NATIONAL POLICY IMPLICATIONS 79 (Comm. Print No. 9 1980) (CIS H442-10 1980) [hereinafter U.S. MINERALS VULNERABILITY].

12. The largest end use of platinum group metals has been in the manufacture of automobile catalytic converters. MINERAL COMMODITY SUMMARIES 1986, *supra* note 2, at 119. In 1981, for example, 32% of the 1.92 million troy ounces (one troy ounce is equal to 1.09714 avoirdupois ounces (U.S. DEP'T OF THE INTERIOR, BUREAU OF MINES, A DICTIONARY OF MINING, MINERAL, AND RELATED TERMS 1169 (1968))) used by the United States contributed to the manufacture of catalytic converters. OTA REPORT, *supra* note 9, at 14.

tier" minerals, the Soviet Union is almost totally independent of foreign sources for the same minerals.¹³

As we approach the twenty-first century, the United States will become increasingly dependent on foreign mineral sources.¹⁴ As American strategic mineral consumption increases,¹⁵ we will become even more dependent on a handful of countries whose political structures have recently experienced volatile changes or whose mineral shipments have been affected by political upheavals in neighboring countries.¹⁶ In the past twenty-five years, the United States' supply of strategic minerals has been severely disrupted four times.¹⁷ It is quite possible that strategic mineral supplies could be disrupted again. As human rights abuses in South Africa¹⁸ and Zaire¹⁹ mount, the probability of political upheaval

13. See III U.S. DEP'T OF THE INTERIOR, BUREAU OF MINES, MINERALS YEARBOOK 1984, AREA REPORTS: INTERNATIONAL 829-64 (1984) for mineral production and trade information. Estimated mineral trade, production and consumption figures for the Soviet Union in 1984 indicated that it imported roughly half of its cobalt requirements, while it actually exported chromium, manganese and platinum group metals. In 1983, the United States was one of the largest importers of Soviet platinum group metals exports. *Id.* at 838.

14. American demand for chromium is expected to double between 1981 and the turn of the century. OTA REPORT, *supra* note 9, at 13. Manganese requirements are also expected to rise significantly by the year 2000. *Id.* Cobalt demand in the United States is expected to grow more slowly in the future, but platinum group metals requirements will more than double for uses in catalytic converters and in the chemical industry by 1995 if current trends continue. *Id.* at 13-14.

15. *Id.*

16. *Id.* at 83. In 1976, insurgents from Angola invaded Shaba province in Zaire and disrupted Zaire's cobalt exports. *Id.* at 99. The strife in Angola also affected railroad shipments of cobalt from Zaire and Zambia when, in 1975, the Angolan rebels shut down the Angolan railroad, a major artery for shipment of Central African minerals. *Id.* at 97.

17. *Id.* at 15. In 1949, the Soviet Union halted exports of manganese and chromium to the United States as the Cold War enveloped the two countries. From 1966 to 1971, the United States boycotted chromium exports from Rhodesia in an effort to apply pressure to the white minority government's exclusion of blacks in the political process. *Id.* To make up for the loss of Rhodesian chrome, the United States sold off part of its stockpiles and U.S. industry turned to the Soviets for additional chromium imports. In 1969, Canadian nickel miners went on strike. *Id.* at 16. The United States, which relied almost exclusively on nickel from Canada, had to reduce its domestic stockpiles to compensate for the diminished supply from Canada. The 1978-79 cobalt "shortage" was caused by rebel unrest in Zaire. *Id.* Although cobalt production in Zaire actually increased during this period, panic buying pushed the price of cobalt well above its normal price. After the United States halted sales of cobalt from its stockpile, private industry was forced to recycle cobalt and to find alternatives for the metal in many of its products. *Id.* at 15-17.

18. See, e.g., *The Human Rights Situation in South Africa, Zaire, the Horn of Africa, and Uganda: Hearings before the Subcomm. on Human Rights and International Organizations and the Subcomm. on Africa of the Comm. on Foreign Affairs*, H.R., 98th Cong., 2d Sess. 17-26 (1984) (statement of Elliott Abrams, Assistant Secretary of State for Human Rights and Humanitarian Affairs) (CIS H381-53 1985) [hereinafter *Human Rights Situation*].

19. *Id.* at 66-78 (statement of Helen E. Scoville, Africa area coordinator, Amnesty Int'l).

accompanied by mineral supply disruptions increases.²⁰

Mindful of potential strategic mineral supply disruptions, the Reagan Administration has adopted a policy of gentle persuasion or "constructive engagement" toward several countries that produce important strategic minerals. In reality, the United States has done little more than mildly encourage these countries to improve human rights conditions.²¹ Although Congress has recently taken more affirmative action concerning human rights violations in South Africa, U.S. foreign policy on human rights in strategic mineral producing countries remains weak.²²

20. See SENATE COMM. ON FOREIGN RELATIONS, 97TH CONG., 2D SESS., U.S. MINERALS DEPENDENCE ON SOUTH AFRICA 11-15, (Comm. Print 1982) (CIS S382-32 1982) [hereinafter U.S. MINERALS DEPENDENCE ON SOUTH AFRICA].

21. For example, the United States has adopted a policy of quiet diplomacy or constructive engagement with the governments of Zaire, South Africa and Chile. Concerning South Africa, Vernon Walters, former Ambassador-at-Large, expressed the Reagan Administration's view that:

Political and economic stability in South Africa is our best insurance against harmful disruptions in the supply of critical materials from that country. True stability can only be attained when all people of South Africa are allowed to exercise their legitimate political and economic rights. Through our policy of constructive engagement with South Africa, we are helping to foster peaceful change in this direction as best we can.

Geopolitics of Strategic and Critical Materials: Hearings Before the Comm. on Energy and Natural Resources, United States Senate, 98th Cong., 1st Sess. 20 (1983) (statement of Vernon A. Walters, former Ambassador-at-Large, Dep't of State) (CIS S311-4 1984) [hereinafter Geopolitics]. Similar rhetoric can be found in Reagan Administration testimony concerning Zaire. *Human Rights Situation, supra* note 18, at 15-17 (statement of Elliott Abrams, Assistant Secretary of State for Human Rights and Humanitarian Affairs). The Reagan Administration's policy toward Chile is also one of tolerance accompanied by gentle prodding. *Human Rights in Chile: Hearing before the Subcomms. on Human Rights and International Organizations and on Western Hemisphere Affairs of the Comm. on Foreign Affairs, H.R., 99th Cong., 1st Sess. 110 (1985) (Appendix 1: Responses From the Department of State to Questions Submitted by Representative Gary L. Ackerman) (CIS H381-58 1985) [hereinafter Human Rights in Chile].* While the United States produces most of the copper it needs, Chile provides the bulk of U.S. imports from foreign sources. MINERAL COMMODITY SUMMARIES 1986, *supra* note 2, at 42.

22. In October 1986, Congress voted to override President Reagan's veto of a Senate bill which imposed sanctions on South Africa. While the bill included measures to boycott South African exports of iron, steel, coal and uranium, minerals such as chromium, manganese, platinum and diamonds were conspicuously absent from the list. See Anderson, Willenson, Whitmore & Getz, *At Last, Sanctions*, NEWSWEEK, October 13, 1986, at 49. The Senate bill appeared to be more of a symbolic action of U.S. opposition to apartheid than a genuine effort to impose serious economic hardship on South Africa. Indeed, four years earlier, the Senate Foreign Relations Committee concluded that a worldwide boycott of South African strategic minerals would never be effective because Europe, Japan and the United States heavily depend on South African chromium, manganese, vanadium, platinum group metals, coal and uranium. U.S. MINERALS DEPENDENCE ON SOUTH AFRICA, *supra* note 20, at 9. The Foreign Relations Committee also stated that:

[D]isruptions in our supply of minerals are most likely to come about if change is violent, and . . . are more likely to occur the longer change is prevented and the more

As a result, the United States has been criticized for having a double standard toward human rights violations.²³ For example, while the United States has aggressively endorsed an economic boycott of Nicaragua to force changes in human rights conditions there, the United States has done comparatively little to bring about changes in Chile's treatment of human rights.²⁴

Obviously, U.S. foreign policy toward strategic mineral producing countries is not entirely controlled by our dependence on their mineral wealth. However, this nation's foreign policy decisions can be significantly affected by our dependence on foreign strategic mineral sources.

III. DEVELOPMENT OF U.S. STRATEGIC MINERAL POLICY

For nearly fifty years, the United States has had some form of strate-

black advocates of change see . . . the United States . . . as being disinterested in such change.

. . . [E]conomic sanctions, or even discouragement of U.S. investment in South Africa, is probably not productive, but . . . symbolic actions to indicate our disapproval of the apartheid system should be sought rather than avoided.

Id. at 18-19.

While Congress may have changed its mind about implementing sanctions against South Africa, the effect of boycotting South African uranium and coal is not likely to cause the United States any major problems considering the size of U.S. domestic coal and uranium resources. The net result of a boycott of South African coal and uranium is largely symbolic.

23. See, e.g., *Review of State Department Country Reports on Human Rights Practices for 1981: Hearing Before the Subcomm. on Human Rights and International Organizations of the Comm. on Foreign Affairs*, H.R. 97th Cong., 2d Sess. 73-81 (1982) (statement of Donald L. Ranard, Director, Center for International Policy) (CIS H381-73 1982). Mr. Ranard, in evaluating State Department country reports for human rights practices, stated that "the State Department is as guilty of the use of double standards [toward human rights] as are those it seeks to blame for similar bias." *Id.* at 78. He noted that the United States mounted an ostentatious campaign against human rights violations in Poland and against the arrest of Polish labor leader Lech Walesa. Meanwhile, the United States followed a course of quiet diplomacy when the pro-American South Korean government imprisoned moderate Korean opposition leader, Kim Dae-jung. *Id.* at 78-79.

24. Disparate application of U.S. foreign policy is evident from State Department answers to questions posed by the House Committee on Foreign Affairs concerning U.S. foreign policy toward Chile and Nicaragua:

Q. Mr. Secretary, . . . I have not heard any real tough message coming out of this Administration concerning the gross violations of rights in Chile? You manage to put this apparatus together concerning Nicaragua. Why is there a double standard?
A. — The Administration has only one standard with regard to Chile, Nicaragua, other countries in the region.

. . . [W]e do not see a parallel between the position of the Sandinista regime in Nicaragua and the position of the military government of Chile. There is a commitment in Chile to a democratic transition process, on the part of both the government and the democratic forces outside of government. In Nicaragua, the only commitment to democracy to be found lies outside of government.

Human Rights in Chile, *supra* note 21, at 110.

gic mineral policy.²⁵ The focus of this policy has been on a national stockpile for strategic minerals. The stockpile, created by Congress in 1939, is composed of eighty mineral commodities²⁶ and is currently worth over \$11 billion.²⁷ In addition to establishing a national strategic mineral stockpile, Congress enacted a series of federal statutes to reduce U.S. dependence on foreign minerals. These statutes have reflected the shifting pattern of political attitudes toward the national stockpile and the policy goals of strategic mineral independence.

A. Early Development of U.S. Strategic Mineral Policy: 1939-1951

In 1939, Congress passed the Strategic Materials Act.²⁸ The Act created a national stockpile of strategic materials and authorized the government to determine the quality and quantity of materials to be stockpiled.²⁹ In 1946, Congress reaffirmed its commitment to building a national stockpile when it amended the Strategic Materials Act by passing the Strategic and Critical Materials Stockpiling Act.³⁰ The 1946 Act stressed the importance of lessening American dependence on foreign

25. CONG. OF THE UNITED STATES, CONG. BUDGET OFFICE, STRATEGIC AND CRITICAL NONFUEL MINERALS: PROBLEMS AND POLICY ALTERNATIVES 8 (1983) (CIS J932-34 1983) [hereinafter NONFUEL MINERALS].

26. *Id.* at 7-8.

27. *Id.* at 9.

28. Ch. 190, 53 Stat. 811 (1939) (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)).

29. NONFUEL MINERALS, *supra* note 25, at 8. The Act's stated purpose was to: [P]rovide for the common defense by acquiring stocks of strategic and critical materials essential to the needs of industry for the manufacture of supplies for the armed forces and the civilian population in time of a national emergency, and to encourage, as far as possible, the further development of strategic and critical materials within the United States for common defense.

Strategic Materials Act, ch. 190, 53 Stat. 811 (1939) (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)).

30. Ch. 590, 60 Stat. 596 (1946) (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)). The new Act broadened the scope of the original 1939 Act by adding the terms, "retention" and "conservation" to the earlier objectives of the policy. The new declaration of policy stated:

That the natural resources of the United States in certain strategic and critical materials being deficient or insufficiently developed to supply the industrial, military, and naval needs of the country for common defense, it is the policy of the Congress and the purpose and intent of this Act to provide for the acquisition and retention of stocks of these materials and to encourage the conservation and development of sources of these materials within the United States, and thereby decrease and prevent wherever possible a dangerous and costly dependence of the United States upon foreign nations for supplies of these materials in times of national emergency.

Id. at 596. The Act also called for the "scientific, technologic, and economic investigations concerning the extent and mode of occurrence, the development, [and] mining . . . of ores . . . essential to the common defense or the industrial needs of the United States." *Id.* at 599.

sources by developing domestic sources of strategic minerals.³¹

The Defense Production Act of 1950³² (DPA) supported the principles behind the Strategic and Critical Materials Stockpiling Acts. The DPA gave the President broad powers to encourage development of mineral resources and their production during times of war.³³ The DPA also encouraged domestic mining of strategic minerals. Through the use of direct federal subsidies, purchase commitments and loan guarantees,³⁴ the DPA contributed to the nation's war effort during the Korean conflict and stimulated domestic development of minerals.³⁵ A few years after Congress passed the DPA, domestic aluminum production doubled, domestic copper mining capacity increased twenty-five percent, tungsten mining quadrupled, and a new nickel and a titanium mining industry developed.³⁶

B. A Change in Focus of U.S. Strategic Mineral Policy: 1951-1974

Beginning in 1951, the focus of American strategic mineral policy toward building and maintaining the national stockpile changed. In 1951, the President's Materials Policy Commission ("Paley Commission") endorsed a policy that the United States should obtain strategic minerals "at the least cost possible for equivalent values."³⁷ The net result of this policy shift was that domestic production of strategic minerals no longer had priority over lower-cost foreign sources of the same minerals.³⁸

While the Paley Commission realized that the United States could never be self-sufficient in many strategic minerals, it underestimated our country's ability to develop its own mineral resources.³⁹ The Paley Commission, as a result of its inaccurate predictions of domestic mineral pro-

31. *Id.*

32. Ch. 932, 64 Stat. 798 (1950) (codified as amended at 50 U.S.C. app. §§ 2061 *et seq.* (1982 & Supp. III 1985)).

33. OTA REPORT, *supra* note 9, at 340. To encourage development of mineral resources, the Act authorized loans and loan guarantees for expansion of capacity, development of technological processes or the production of essential materials including the exploration, development and mining of strategic minerals. *Id.* See also *supra* note 32, at 801.

34. OTA REPORT, *supra* note 9, at 30.

35. McClure, *Stockpiling of Strategic and Critical Materials*, 19 IDAHO L. REV. 417, 428 (1983).

36. *Id.*

37. NONFUEL MINERALS, *supra* note 25, at 9. The effect of the Paley Commission's policy was to encourage the United States to purchase lower-cost minerals from foreign sources where the price for domestic minerals was in excess of foreign prices. *Id.*

38. *Id.*

39. See U.S. MINERALS VULNERABILITY, *supra* note 11, at 9. The Paley Commission predicted that the United States would be largely dependent on imports of lead and copper by

duction and its adoption of President Truman's policy of free world trade and international cooperation, proposed a policy of importing strategic minerals to meet domestic strategic mineral requirements.⁴⁰

In 1954, Congress passed the Agricultural Trade Development and Assistance Act.⁴¹ This Act established a bartering system by which surplus American farm goods were traded for foreign strategic minerals. By 1961, the strategic stockpile contained over \$200 million worth of strategic materials which were obtained through bartering.⁴² As farm surpluses dwindled in the early 1970's, the barter program was suspended by the government. Recently, however, Congress has attempted to revive the bartering system.⁴³

Grain was not the only commodity offered in exchange for strategic minerals; military supplies were also offered. In 1974, Congress passed the Foreign Assistance Act⁴⁴ which intended, among other things, to phase out military grant assistance to foreign countries.⁴⁵ Despite the reduction in foreign military assistance, Congress gave the President authority to trade military supplies for foreign strategic materials.⁴⁶

The government was also responsible for revising strategic mineral stockpile goals several times within a period of less than twenty years. Prior to 1962, stockpile objectives for specific strategic materials were kept secret.⁴⁷ Before 1958, however, the general goal of the stockpile was to accumulate a five-year supply of critical materials. In 1958, this goal

1977. Instead, the United States led the world in copper and lead production from 1952, the year of the Paley Report, through 1977. *Id.* at 9 n.15.

40. *See id.* at 9.

41. Ch. 469, 68 Stat. 454 (1954) (now scattered sections of 7 U.S.C.).

42. McClure, *supra* note 35, at 430.

43. OTA REPORT, *supra* note 9, at 6. In 1981, for example, the United States traded \$47 million worth of dairy products for bauxite from Jamaica. During the 98th Congress, approximately 20 barter bills were introduced. In addition to congressional interest in bartering for strategic materials, the Reagan Administration has established a working group on barter to review proposals on a case by case basis. *Id.*

44. 22 U.S.C. § 2151 *et seq.* (1982 & Supp. III 1985).

45. S. REP. NO. 1299, 93rd Cong., 2d Sess., reprinted in 1974 U.S. CODE CONG. & ADMIN. NEWS 6674, 6675.

46. Section 2423 provides:

(a) Notwithstanding any other provision of law, whenever the President determines it is in the United States national interest, he shall furnish assistance under this chapter or shall furnish defense articles or services under the Foreign Military Sales Act pursuant to an agreement with the recipient of such assistance, articles, or services which provides that such recipient may only obtain such assistance, articles, or services in exchange for any necessary or strategic raw material controlled by such recipient.

22 U.S.C. § 2423 (1982).

47. A. JORDAN & R. KILMARX, STRATEGIC MINERAL DEPENDENCE: THE STOCKPILE DILEMMA 42 (1979) [hereinafter JORDAN & KILMARX].

was reduced to three years, and in 1972, the goal established for the stockpile called for only a one-year supply of critical materials.⁴⁸

Subsequent congressional examinations revealed that not only did general strategic mineral goals fluctuate, but stockpile objectives for specific minerals also varied from year to year.⁴⁹ The erratic changes in stockpile objectives suggest that factors other than national security interests may have guided many sales of strategic minerals made by the President.⁵⁰ For instance, during the Vietnam War, stockpiled supplies of aluminum, copper and nickel were eliminated by President Nixon. Some senators suggested that the minerals were declared as surplus and sold from the stockpile because of their ease of liquidation, rather than because they were actually in excess of needed amounts.⁵¹ President Nixon's motive for selling the minerals may have been to balance the budget and improve foreign exchange balances.⁵²

During the early 1970's, while the size of the strategic stockpile decreased and dependence on foreign sources for strategic minerals increased, Congress made a well-meaning but ineffective attempt to enact legislation that would encourage domestic production and conservation of strategic minerals. The Mining and Minerals Policy Act of 1970⁵³ (MMPA) established the national policy goals of

foster[ing] and encourag[ing] private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmen-

48. OTA REPORT, *supra* note 9, at 6. The one-year level was based on President Nixon's philosophy that any war would last only one year and that alternate sources and methods would be found to overcome any shortages in strategic minerals. McClure, *supra* note 35, at 448.

49. JORDAN & KILMARX, *supra* note 47, at 42-45. An example of the erratic fluctuations in stockpile objectives for various strategic minerals is typified by the stockpile objectives for platinum. In 1951, platinum objectives were at 790,000 troy ounces. By 1956, however, platinum objectives were at 235,000 troy ounces and dropped even further in 1958 to 154,000 troy ounces. Stockpile objectives for platinum increased to 555,000 troy ounces by 1969, but dropped again to 187,500 troy ounces in 1973. *Id.* at 43-44.

50. *Id.* at 42. Possible nonsecurity considerations include: "purchase of materials to improve U.S. relations with other countries; the sale of commodities in an effort to control prices or reduce inflation; and the sale of commodities to help balance the national budget, since proceeds from sales revert directly to the general funds of the Treasury." *Id.* at 58 (quoting Sen. McClure).

51. *Id.* at 42, 58.

52. *Id.* at 58.

53. 30 U.S.C. § 21a (1982).

tal needs, (3) mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the wise and efficient use of our natural and reclaimable mineral resources, and (4) the study and development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined land⁵⁴

While the MMPA gave the Secretary of the Interior responsibility "to carry out this policy when exercising his authority under such programs as may be authorized by law other than this section," the Secretary denied that he had any broad authority to implement the Act.⁵⁵ Congress intended to use the MMPA to establish a broad overall national mineral policy.⁵⁶ However, the executive branch gave the Act little or no priority, and American strategic mineral dependence increased.⁵⁷ Had the Department of Interior carried out the policy goals of the Act, United States' dependence on foreign strategic mineral sources might have been reduced in the 1970's.

After the 1973-74 oil embargo, Congress enacted the National Commission on Supplies and Shortages Act of 1974.⁵⁸ Congress reported that the "United States is increasingly dependent on the importation from

54. *Id.* See also H.R. REP. NO. 1442, 91st Cong., 2d Sess., reprinted in 1970 U.S. CODE CONG. & ADMIN. NEWS 5792, 5792-93.

55. 30 U.S.C. § 21a (1982). In a letter to the Chairman of the Mines and Mining Subcommittee of the Interior and Insular Affairs Committee, the Secretary of the Interior explained the limitations of his duties under the Act:

I also want to note that, while P.L. 91-631 makes the declaration of a "Federal Government" policy, the only specific mandate within that Act is to the Secretary of the Interior. That mandate is twofold. First, it requires that I submit an Annual Report to the Congress. Second, it requires me to carry out the policy objectives set forth in the Act in "exercising authority under such programs as may be authorized by law other than this Act." The Act does not provide to the Secretary of the Interior any authority or supervisory responsibilities over other Federal Departments as they exercise their authorities in carrying out responsibilities which affect mineral policy. This is a very critical distinction and one that must be clearly understood.

U.S. MINERALS VULNERABILITY, *supra* note 11, at 16-17.

56. H.R. REP. NO. 1442, 91st Cong., 2d Sess., reprinted in 1970 U.S. CODE CONG. & ADMIN. NEWS 5792, 5792.

57. U.S. MINERALS VULNERABILITY, *supra* note 11, at X-XI. The Subcommittee on Mines and Mining was not complimentary in its evaluation of the Department of Interior's implementation of the Act's policy goals:

The Department of the Interior with its preeminent concerns for other resources, has been woefully negligent in the performance of its responsibilities regarding the Nation's minerals. The Department has blatantly ignored the findings and recommendations of numerous expert studies on mineral policy stretching over the past 30 years and has abdicated its responsibilities in implementing the single existing congressional statement of national mineral policy—the Mining and Minerals Policy Act of 1970.

Id. at XI.

58. 50 U.S.C. app. § 2169 (1982).

foreign nations of certain natural resources vital to commerce and the national defense."⁵⁹ Congress also was concerned that nations exporting strategic minerals to the United States could arbitrarily raise the prices of the minerals to levels that would cause disruption of domestic and foreign economies.⁶⁰ The Act established the National Commission on Supplies and Shortages to "report to the President and the Congress on needed institutional adjustments for examining and predicting shortages and on the existence or possibility of shortages with respect to essential resources and commodities."⁶¹ Despite Congress' concern over growing U.S. dependence on foreign nations, the Commission of Supplies and Shortages concluded that the United States should not become overly concerned with its increasing demand for foreign natural resources.⁶² The Commission felt that foreign embargoes, cartels or sustained-price manipulations were unlikely, and that significant shortages would probably result only from shifts in supply and demand that exceeded the response capabilities of the industry.⁶³ To solve the shortage problem, the Commission proposed more international investment in mineral development rather than increased reliance by the United States on domestic mineral production.⁶⁴

C. Reappraisal of United States Strategic Mineral Policy: 1975-1986

1. The national stockpile policy

In 1975, the United States began to reevaluate its strategic mineral policy. Amidst congressional criticism that a one-year supply of strategic materials in the national stockpile was inadequate, the Ford Administration undertook a study of national stockpile policy. In 1976, after the study was completed, President Ford approved a new stockpile policy that: (1) required planning to be based on a three-year emergency requirement; (2) would take into account both civilian and defense needs; and (3) would estimate civilian and defense needs separately.⁶⁵ During his administration, President Carter additionally mandated that the stockpile be ready to accommodate a one year NATO war in Europe with no more than thirty days advance notice.⁶⁶

59. *Id.* § 2169(b)(1).

60. *Id.* § 2169(b)(2).

61. *Id.* § 2169(c).

62. See U.S. MINERALS VULNERABILITY, *supra* note 11, at 11-12 for a discussion of the Commission's conclusions.

63. *See id.*

64. *See id.* at 12.

65. JORDAN & KILMARX, *supra* note 47, at 46.

66. *Id.*

a. *the Strategic and Critical Materials Stock Piling
Revision Act of 1979*

Changes in stockpile policy culminated in 1979 when the Strategic and Critical Materials Stock Piling Revision Act of 1979 repealed the Strategic and Critical Materials Stock Piling Act of 1946.⁶⁷ Echoing the policy changes of the Ford Administration, the 1979 Act called for presidential consideration of civilian as well as military needs for strategic materials.⁶⁸ It also authorized the President to stockpile quantities of strategic and critical materials "sufficient to sustain the United States for a period of not less than three years in the event of a national emergency."⁶⁹ The Act attempted to curb the executive branch's abuse⁷⁰ of the stockpile by limiting the purpose of the stockpile to interests of national defense rather than for curing economic or budgetary problems.⁷¹ Proceeds from resale of stockpiled materials were to be channeled into a separate Treasury Department fund (the National Defense Transaction Fund) rather than into the general fund.⁷² The Act also required the President to notify Congress of any disposals of materials from the stockpile.⁷³

While the Act encouraged domestic development of mineral resources,⁷⁴ it also promoted barter as a method for acquiring or disposing of strategic materials from the stockpile.⁷⁵ Congress also prohibited the President from restricting importation of strategic minerals from any country from which importation was lawful.⁷⁶

b. *amendments to the 1979 act*

In 1981, Congress amended the 1979 Act to make it more effective in achieving stockpile goals. Congress eliminated time constraints on the President for spending the money appropriated by Congress for purchasing materials for the stockpile. Congress also eliminated the provision which allowed money from the disposal of stockpiled materials to be transferred from the separate National Defense Transaction Fund to the

67. 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985).

68. 50 U.S.C. § 98a(a) (1982).

69. *Id.* § 98b(b)(2).

70. *See supra* notes 50-52 and accompanying text.

71. 50 U.S.C. § 98b(b)(1) (1982). *See also* McClure, *supra* note 35, at 431.

72. 50 U.S.C. § 98h (1982 & Supp. III 1985).

73. 50 U.S.C. § 98f (1982).

74. *Id.* § 98g.

75. *Id.* § 98e(c)(1).

76. *Id.* § 98h-4.

general Treasury fund after three years.⁷⁷

Other amendments gave Congress authority to object to presidential decisions concerning stockpile transactions.⁷⁸ Recently, however, Congress' power to veto an action by the executive branch was declared unconstitutional by the Supreme Court.⁷⁹ The Court's decision cast doubt on the constitutionality of Congress' authority to object to presidential decisions concerning stockpile transactions.⁸⁰

In 1979, the stockpile needed an additional \$12.9 billion worth of strategic minerals to fulfill the 1979 Act's three-year supply requirements. For fiscal year 1985, the Reagan Administration proposed selling \$78 million in surplus materials from the stockpile and purchasing \$120 million in needed materials for the stockpile. If this rate were applied each year after 1985, it would take 100 years to meet the three-year supply requirements established by the Act.⁸¹

2. National mineral policy

In 1977, members of Congress encouraged President Carter to give priority to meeting the goals of the Mining and Mineral Policy Act of 1970.⁸² In response to the increasing vulnerability of the United States to disruptions in its strategic mineral supply, President Carter ordered a cabinet-level comprehensive review of nonfuel minerals under the supervision of the Nonfuel Mineral Policy Coordinating Committee (NMPCC).⁸³ The NMPCC, however, failed to satisfactorily address the national security implications arising from increased U.S. dependence on foreign mineral sources.⁸⁴ Like the previous administrations, the Carter

77. McClure, *supra* note 35, at 432-33. The amendments were introduced by Congressman Charles Bennett after he became convinced that the Reagan Administration was attempting to reduce the budget deficit by selling off more than two billion dollars in excess materials from the stockpile, keeping the money in the separate Treasury fund for three years and allowing it to automatically transfer to the general Treasury fund after the three years had lapsed. Once in the general Treasury fund, the money could be used by the President for uses other than for stockpile purposes. *Id.* at 433.

78. 50 U.S.C. § 98d(a)(2) (1982).

79. *See* *Immigration and Naturalization Service v. Chadha*, 462 U.S. 919 (1983) (one-house legislative veto held unconstitutional because it violated both President's veto power under presentment clause and bicameral requirement of U.S. CONST. art. I, §§ 1 & 7).

80. *See* 50 U.S.C.A. § 98d note (West Supp. 1987).

81. OTA REPORT, *supra* note 9, at 6.

82. Santini, *The Growing Crisis in the Strategic and Critical Minerals of the United States*, 7 J. LEGIS. 63, 65 (1980).

83. *Id.* The Nonfuel Mineral Policy Coordinating Committee (NMPCC) conducted the review and Cecil Andrus, then Secretary of the Interior, chaired the review. *Id.* at 65 n.13.

84. *Id.* at 65. The House Subcommittee on Mines and Mining of the Committee on Interior and Insular Affairs noted widespread dissatisfaction with the NMPCC's report. It stated: The entire effort was a tragic waste that cost American taxpayers about \$3.5 million

Administration continued to ignore the congressional policy set forth in the Mining and Mineral Policy Act of 1970—the development of domestic mineral resources.⁸⁵

a. National Materials and Minerals Policy, Research and Development Act of 1980

In response to growing U.S. dependence on foreign sources for many of its strategic materials, Congress passed the National Materials and Minerals Policy, Research and Development Act of 1980 (NMMPRDA).⁸⁶ The Act reaffirmed the goals expressed in the Mining and Mineral Policy Act of 1970 and directed the executive branch to carry out the goals of the 1970 Act.⁸⁷ While the Mining and Mineral Policy Act went a long way toward establishing a national mineral policy, the 1980 Act was Congress' first piece of legislation which addressed the need for a comprehensive national materials policy.⁸⁸

The Act states the congressional finding that "the United States lacks a coherent national materials policy and a coordinated program to

and the loss of some 13,000 person-days. Of the 42 witnesses who testified on the "Report on the Issues" at the Administration's September 1979 hearings, none considered the final product adequate. In fact, nearly every witness stated that report should be withdrawn and completely redone.

The Committee also received testimony from experts representing producing and consuming mineral industries, academia, and private consultants and institutions. To a witness, these experts took issue with the findings of the Department of the Interior.

U.S. MINERALS VULNERABILITY, *supra* note 11, at 24.

85. Burling, *United States Minerals Policy—A Proposal to Revitalize the Exploration and Development of Domestic Mineral Resources*, 24 ARIZ. L. REV. 881, 896 (1982) [hereinafter Burling I].

86. 30 U.S.C. §§ 1601-1605 (1982).

87. Section 1605 expressly states that:

[T]he President shall direct (1) the Secretary of the Interior to act immediately within the Department's statutory authority to attain the goals contained in section 21a [of the Mining and Mineral Policy Act of 1970] of this title and (2) the Executive Office of the President to act immediately to promote the goals contained in section 21a of this title among the various departments and agencies.

Id. § 1605.

88. S. REP. NO. 897, 96th Cong., 2d Sess., reprinted in 1980 U.S. CODE CONG. & ADMIN. NEWS 4871, 4872 [hereinafter S. REP. NO. 897]. While Congress had previously emphasized national mineral policy, the scope of the 1980 Act included both mineral and nonmineral substances:

"[M]aterials" means substances, including minerals, of current or potential use that will be needed to supply the industrial, military, and essential civilian needs of the United States in the production of goods or services, including those which are primarily imported or for which there is a prospect of shortages or uncertain supply, or which present opportunities in terms of new physical properties, use, recycling, disposal or substitution, with the exclusion of food and of energy fuels used as such.

30 U.S.C. § 1601(b) (1982).

assure the availability of materials critical for national economic well-being, national defense and industrial production”⁸⁹ Congress also expressed in its findings that the United States was vulnerable to disruptions in materials supplies because of its dependence on other countries for many materials essential to national security.⁹⁰

A declaration of policies followed Congress’ findings and included the goals of: (1) identifying which materials were subject to disruptions and what measures were necessary to assure their continued availability; (2) coordinating activities of federal agencies and activities between federal agencies and the private sector; (3) promoting a vigorous program of materials research and development; (4) engaging in cooperative research and development programs with other countries for enacting conservation measures; (5) promoting and encouraging domestic private materials enterprises to provide for critical materials needs; and (6) encouraging federal agencies to facilitate availability and development of domestic resources needed to fill critical materials needs.⁹¹

Congress relied on the President to direct the appropriate federal departments and agencies to engage in the type of research and activities needed to accomplish the 1980 Act’s goals.⁹² In directing the President to implement its policies, Congress sought to involve several independent executive agencies and departments to implement strategic materials policy.⁹³

The NMMPRDA is the most comprehensive statement of United States strategic mineral policy that Congress has enacted. However, there is no indication that the Act has had any more success at accomplishing its goals than did the Mining and Mineral Policy Act in the 1970’s. As the nation’s budget deficits increased, the government reduced funding for many of the programs needed to carry out the policies of the 1980 Act.⁹⁴ Thus, the Reagan Administration has failed to accom-

89. 30 U.S.C. § 1601(a)(6) (1982).

90. *Id.* § 1601(a).

91. *Id.* § 1602.

92. *Id.* § 1603.

93. *Id.* § 1604(b)-1604(f). *See also* S. REP. NO. 897, *supra* note 88, at 4875-76.

94. *See, e.g., Appropriations for the Department of the Interior and Related Agencies: Hearings Before the House Subcomm. on Appropriations*, 200, 201 (Feb. 28, 1985) (statement of Donald Hodel, Secretary of the Interior) (CIS H181-41.3 1985) [hereinafter *Hodel Statement*]. The NMMPRDA instructed the Secretary of Interior to:

- (1) improve the capacity of the Bureau of Mines to assess international minerals supplies;
- (2) increase the level of mining and metallurgical research by the Bureau of Mines in critical and strategic minerals; and
- (3) improve the availability and analysis of mineral data in Federal land use decisionmaking.

plish the goals of the 1980 Act.

b. National Critical Materials Act of 1984

As a result of the government's failure to fully implement the policies of the NMMPRDA, Congress passed the National Critical Materials Act of 1984.⁹⁵ This Act established a National Critical Materials Council and gave the President power to appoint the Council's three members.⁹⁶ The 1984 Act authorized the Council to appoint an executive director who would hire the personnel necessary to carry out the Council's functions.⁹⁷ The Council's responsibilities entailed assisting and advising the President in establishing national materials policies and priorities.⁹⁸ Congress also gave the Council the power to: (1) coordinate federal materials-related policies, programs and research; (2) review and appraise federal materials programs pursuant to the NMMPRDA; (3) monitor and evaluate private and governmental critical materials needs; (4) advise the President of current mineral and material trends; and (5) provide reports on materials issues to the President, designated federal agencies and Congress.⁹⁹

30 U.S.C. § 1604(e) (1982). For the Bureau of Mines, Secretary of the Interior Hodel proposed for fiscal year 1986 a reduction of thirty-two million dollars from the 1985 appropriated budget of 136 million dollars. Research programs were among the proposed cuts. *Hodel Statement, supra*, at 215.

95. 30 U.S.C. §§ 1801-1811 (Supp. III 1985). In passing the Act, Congress noted that:

The current Administration has taken a number of steps to address materials concerns and to implement P.L. 96-479 [NMMPRDA].

...
Unfortunately, as noted in testimony by industry and others, these actions have been inadequate. While focusing on the important issues of minerals and mining materials, processing and advanced materials concerns have been largely ignored. Of four reports and assessments required by P.L. 96-479, only one has been officially presented to Congress as of October 1983. The Cabinet Council, while potentially useful as the required coordinating and implementing mechanism, has not been fully effective. As noted in testimony, the Council has met only infrequently on materials issues and on an *ad hoc* basis without permanence or clearly defined lines of communication with the rest of the Federal Government. Perhaps more important, another administration with other priorities and organizational ideas could easily abolish such a mechanism.

In view of this, [this Act] provides the next logical step by establishing statutorily the organizational mechanism to determine materials policies and priorities as well as responsibilities for implementation of resulting programs. The National Critical Materials Council established by the legislation also focuses on advanced materials research and technology development in basic and advanced materials industries.

H.R. REP. NO. 593, 98th Cong., 2d Sess., reprinted in 1984 U.S. CODE CONG. & ADMIN. NEWS 2230, 2233-34.

96. 30 U.S.C. § 1802 (Supp. III 1985).

97. *Id.* § 1807.

98. *Id.* § 1803(a).

99. *See id.*

While Congress had hoped to establish an effective strategic materials policy, the Reagan Administration was in no hurry to comply. It took eighteen months for President Reagan to appoint the three-member Council and for the Council to appoint an executive director. Since then, two of the Council members have left.¹⁰⁰ It would appear that the National Critical Materials Act of 1984 has not met with any more success than its predecessors—the Mining and Mineral Policy Act of 1970 and the National Materials and Minerals Policy, Research and Development Act of 1980.

IV. U.S. STRATEGIC MINERAL POLICY GOALS

The basic goal of United States strategic mineral policy is to decrease American dependence on foreign strategic mineral sources. To achieve this goal, the United States must: (1) increase domestic production of strategic minerals; (2) decrease domestic consumption of strategic minerals; and (3) find alternative sources for meeting strategic mineral needs. While many good proposals have been suggested for reducing U.S. dependence on strategic minerals, all conflict with previously existing national goals and laws. In nearly every case, Congress and the courts appear to have attached greater importance to the competing goal or law than to the existing laws and policies concerning strategic minerals.

A. Increasing Domestic Production of Strategic Minerals

The earliest and most commonly cited proposal to decrease dependence on foreign strategic mineral sources is to increase domestic production of our own mineral resources.¹⁰¹ When formulating domestic

100. Willenson & Getz, *The Mines of Apartheid*, NEWSWEEK, Aug. 11, 1986, at 30.

101. The Strategic Materials Act of 1939 stated:

That the natural resources of the United States in certain strategic and critical materials being deficient or insufficiently developed to supply the industrial, military, and naval needs of the country for common defense, it is the policy of Congress and the purpose and intent of this Act to provide for the acquisition of stocks of these materials and to encourage the development of mines and deposits of these materials within the United States, and thereby decrease and prevent wherever possible a dangerous and costly dependence of the United States upon foreign nations for supplies of these materials in times of national emergency.

Ch. 190, 53 Stat. 811 (1939) (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)).

Since 1939, other statutes have incorporated similar language as part of their policy statement. See Mining and Minerals Policy Act of 1970, 30 U.S.C. § 21a (1982); Materials and Minerals Policy, Research and Development Act of 1980, 30 U.S.C. § 1602(7) (1982); National Critical Materials Act of 1984, 30 U.S.C. § 1801(a)(6) (Supp. III 1985); Strategic and Critical Materials Stock Piling Act, ch. 590, 60 Stat. 596, 596 (1946) (codified as amended at

strategic mineral policy, Congress relied on the Department of Interior through the United States Bureau of Mines (USBM) and the United States Geological Survey (USGS) to facilitate development of domestic mineral resources. The USBM and USGS defined the mineral resources through scientific, technological and economic studies.¹⁰² Beginning with the Defense Production Act in 1950, Congress encouraged private enterprise to take an active role in developing domestic strategic mineral resources.¹⁰³ Recent statutes concerning strategic mineral policy have also encouraged private enterprise to develop domestic minerals and materials industries.¹⁰⁴

While the objectives of locating and developing domestic mineral resources have been a part of U.S. strategic mineral policy for nearly thirty years, it has become progressively more difficult to develop domestic mineral resources in this country. Part of the problem is the escalating cost of locating new mineral deposits. Mineral deposits were previously discovered through relatively inexpensive exploration techniques.¹⁰⁵ New ore deposits often must be discovered through the use of

50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)); Strategic and Critical Materials Stock Piling Revision Act of 1979, 50 U.S.C. §§ 98a, 98g (1982); Defense Production Act of 1950, ch. 932, 64 Stat. 798, 801 (1950) (codified as amended at 50 U.S.C. app. § 2093 (1982 & Supp. III 1985)); and the Domestic Minerals Extension Act of 1953, 50 U.S.C. app. § 2181 (1982).

Many authors who have examined the problem of strategic mineral dependence in the past have advocated a stronger domestic mineral policy. *See, e.g.,* McClure, *supra* note 35, at 452; Santini, *supra* note 82, at 66; Burling I, *supra* note 85, at 881.

102. *See* Strategic Materials Act, ch. 190, 53 Stat. 811, 812 (1939) (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)) which states:

[T]he Secretary of the Interior, through the Director of the Bureau of Mines and the Director of the Geological Survey, is hereby authorized and directed to make scientific, technologic, and economic investigations concerning the extent and mode of occurrence, the development, mining, preparation, treatment, and utilization of ores and other mineral substances found in the United States . . . which are essential to the common defense or the industrial needs of the United States . . .

Id. Current statutes addressing strategic mineral policy matters also rely on government studies for support in developing domestic mineral resource policy. *See, e.g.,* National Materials and Minerals Policy, Research and Development Act of 1980, 30 U.S.C. § 1604(e)-(f) (1982); Strategic and Critical Materials Stock Piling Revision Act of 1979, 50 U.S.C. § 98g(1)-(3) (1982). Today, the USBM and USGS continue to be active in investigating both domestic and foreign nonfuel mineral resources. *See Hodel Statement supra* note 94, at 213-15.

103. 50 U.S.C. app. §§ 2092-2093 (1982 & Supp. III 1985). The Defense Production Act called for government loans to private business enterprises "for the expansion of capacity, the development of technological processes, or the production of essential materials, including the exploration, development, and mining of strategic and critical metals and minerals." *Id.* § 2092. The President was authorized to make purchases and commitments to purchase metals and minerals from private enterprise for government use or resale. *Id.* § 2093(a).

104. *See, e.g.,* National Materials and Minerals Policy, Research and Development Act of 1980, 30 U.S.C. § 1602(6) (1982).

105. Early prospectors searched for quartz or iron oxide stained rock on the ground or in outcrops. O. YOUNG, WESTERN MINING 18-19 (1982). Other methods used by prospectors

sophisticated and expensive exploration techniques.¹⁰⁶

Another problem has been the growing number of federal and state laws passed by Congress and state legislatures to protect the environment. Many of the laws restrict mineral exploration and development in this country. The added restrictions increase the costs of discovering and developing an ore deposit. As a result, the cost of producing the minerals may exceed their fair market value.

Finally, the private mining industry—the principal force in discovering and developing domestic mineral resources—has experienced unprecedented economic hardship over the past ten years as lower cost mineral imports have undercut domestic mineral production. The result has been an overall decline in domestic mineral exploration and development since 1980.¹⁰⁷

1. Mineral resources and reserves

With the rapid development of the theory of plate tectonics,¹⁰⁸ the field of geology has undergone a revolution over the past twenty-five years.¹⁰⁹ This revolution has affected the search for strategic minerals. The application of plate tectonics theory to mineral exploration has enabled geologists to locate new areas in the United States that have a high

included panning for gold placers, looking for characteristic rock formations, observing the colored alteration products of ore minerals or finding valuable minerals through sheer luck. *Id.* at 18-23.

106. While many of the old prospecting techniques are still used by geologists today, new, sophisticated methods are often used by explorationists searching for concealed ore deposits. Today, geologists use geochemical sampling and analysis techniques that require computerized statistical interpretation. A. ROSE, H. HAWKES & J. WEBB, *GEOCHEMISTRY IN MINERAL EXPLORATION* 519-533 (2d ed. 1979). Geophysical techniques including electromagnetic, induced polarization, radioactivity and gravity methods are also used by explorationists to locate ore deposits. See generally D. PARASNIS, *PRINCIPLES OF APPLIED GEOPHYSICS* (3d ed. 1979). Recently, satellite remote-sensing techniques have become a valuable means of locating ore deposits. See, e.g., Conradsen & Harpøth, *Use of Landsat Multispectral Scanner Data for Detection and Reconnaissance Mapping of Iron Oxide Staining in Mineral Exploration, Central East Greenland*, 79 *ECON. GEOLOGY* 1229 (1984).

107. Houston, Schiller, Atchison, Crawford, Norman & Ryser, *The Death of Mining*, *BUS. WK.*, Dec. 17, 1984, at 64 [hereinafter Houston].

108. AMERICAN GEOLOGICAL INSTITUTE, *AGI DATA SHEETS* (2d ed. 1982) describes plate tectonics as

a hypothesis by which Earth's crust and uppermost mantle are divided into a number of plates . . . whose horizontal movement is that of rigid bodies. The plates consist of both continental and oceanic material. These plates move over a zone within the upper mantle that has a relatively low resistance to shearing stress. The plates interact along their boundaries with both seismic and tectonic activity. Along some boundaries, plates are consumed; along others, new crustal material is created. Along still other boundaries, plates slide laterally past each other.

Id. at 61.1 (citations omitted).

109. P. KING, *Preface* to *THE EVOLUTION OF NORTH AMERICA* (rev. ed. 1977).

potential for ore¹¹⁰ grade mineralization. Also, recent advances in geochemical, geophysical and remote sensing techniques¹¹¹ have enabled geologists to explore for mineral deposits in places previously thought to be barren of minerals or depleted from previous mining activities. Consequently, scientists employing a new concept or scientific technique may discover a new ore deposit in a location where no one previously suspected that one existed.¹¹²

Mineral exploration techniques have improved over the past twenty-five years. However, the costs of discovering a significant mineral deposit have steadily increased. With the exception of gold, the discovery rate for finding significant deposits of major metals has steadily decreased since the middle of the last decade.¹¹³ Given the high cost of searching for a significant mineral deposit and the low probability of discovering a significant "first tier" strategic mineral deposit, domestic exploration for "first tier" strategic minerals is an unattractive investment for most exploration and mining companies.¹¹⁴ Under these circumstances, it is unlikely that significant discoveries of "first tier" strategic minerals such as platinum, cobalt, manganese and chromium will occur at any time in the near future.¹¹⁵

2. Federal and state laws

While the likelihood of discovering significant deposits of "first tier"

110. "Ores are rocks and minerals that can be recovered at a profit." C. PARK & R. MACDIARMID, *ORE DEPOSITS* 1 (2d ed. 1970).

111. See OTA REPORT, *supra* note 9, at 206-08.

112. *Id.*

113. Cook, *Analysis of Significant Mineral Discoveries in the Last 40 Years and Future Trends*, 38 *MINING ENGINEERING* 87, 93 (1986). Cook defines a "significant mineral discovery" as one which has a "size and grade [that] would yield more than \$500 million in revenue using average metal prices for the last five years." *Id.* at 87. Cook's data indicates that the discovery rate for significant mineral deposits accelerated during the 1950's and reached its peak in 1962 before declining. *Id.* at 87, 93. The cost of discovering a significant mineral deposit, on the other hand, increased from \$70 million per discovery to \$225 million per discovery in the late 1970's (values expressed in 1982 constant dollars). *Id.* at 87.

114. See OTA REPORT, *supra* note 9, at 204. There are exceptions to this, however. The Stillwater Complex, a chromium, platinum-palladium deposit located in Montana, was extensively explored by several companies including Anaconda Minerals Co., Johns-Manville and Chevron Resources Co. during the early 1980's, and plans were made to eventually mine portions of the complex. *Id.* at 196-98.

115. See *id.* at 204. Part of the reason for the low probability of finding "first tier" mineral deposits is that the type of geologic environments conducive to hosting significant amounts of such deposits are not present in the United States. A. SILVERMAN, J. SCHMIDT, P. QUENEAU & W. PETERS, *STRATEGIC AND CRITICAL MINERAL POSITION OF THE U.S. WITH RESPECT TO CHROMIUM, NICKEL, COBALT, MANGANESE, AND PLATINUM* 4 (Office of Technology Assessment Working Paper) (1983) (CIS J952-52 1985).

strategic minerals in this country is low, the United States has many other important minerals that could be developed were it not for restrictive federal and state laws. The laws—enacted to further this country's goals of preserving wilderness areas, cleaning up the environment and increasing revenue—either have contributed to an outright ban on mineral exploration or have made the costs of mineral exploration and development prohibitively expensive.

a. federal laws and policy goals

Mineral exploration and mining in this country have traditionally been accomplished under the General Mining Law.¹¹⁶ Enacted by Congress in 1872, the General Mining Law has been subject to criticism both by authors opposing and by authors favoring mineral exploration and development.¹¹⁷ Despite the General Mining Law's uncanny longevity, subsequent federal laws have severely limited its original purpose of allowing "all valuable mineral deposits in lands belonging to the United States . . . [to] be free and open to exploration and purchase . . . by citizens of the United States"¹¹⁸

Since 1872, Congress has narrowed the focus of the General Mining Law by removing selected minerals from its coverage and by excluding some federal lands from development of potential mineral resources. In 1920, the Mineral Leasing Act¹¹⁹ removed coal, oil, gas, phosphate, oil shale, sodium, sulfur and potash from location¹²⁰ under the General Mining Law and subjected them to stricter control under a leasing system.¹²¹ In 1955, the Common Varieties Act¹²² further narrowed the scope of the General Mining Law by allowing the extraction of sand, stone, gravel, pumice and petrified wood from federal land through a system of contracts based on competitive bidding.¹²³

While limiting the number of minerals covered by the General Min-

116. 30 U.S.C. §§ 21-54 (1982 & Supp. III 1985).

117. See, e.g., Braunstein, *Natural Environments and Natural Resources: An Economic Analysis and New Interpretation of the General Mining Law*, 32 UCLA L. REV. 1133 (1985) (arguing that mining law is inadequate to meet contemporary mining concerns); Noble, *Environmental Regulation of Hardrock Mining on Public Lands: Bringing the 1872 Law Up to Date*, 4 HARV. ENVTL. L. REV. 145 (1980) (arguing that mining law allows development of mineral resources at the expense of environmental concerns).

118. Act of May 10, 1872, ch. 152, § 1, 17 Stat. 91 (1872) (codified as amended at 30 U.S.C. § 22 (1982 & Supp. III 1985)).

119. Mineral Leasing Act of 1920, 30 U.S.C. §§ 181-287 (1982 & Supp. III 1985).

120. See General Mining Law, 30 U.S.C. §§ 23, 26, 28 (1982 & Supp. III 1985).

121. See Mineral Leasing Act of 1920, 30 U.S.C. §§ 182, 184 (1982).

122. 30 U.S.C. § 611 (1982).

123. See Materials Act of 1947, 30 U.S.C. §§ 601-604 (1982).

ing Law, Congress also enacted legislation that affected the amount of federal land subject to mineral exploration and development. The Surface Resources Act of 1955¹²⁴ limits the amount of surface disturbance caused by the prospector's exploration and mining activities on federal land. Additionally, the 1955 Act subjects mineral exploration activities to surface-management constraints implemented by the federal agency responsible for overseeing the land on which the prospector has staked a claim.¹²⁵ The Act has been used in the past to limit surface disturbances of claimants engaged in common prospecting techniques such as trenching, blasting and drilling activities.¹²⁶

Severe land use restrictions could effectively block many surface activities.¹²⁷ As a result, explorationists¹²⁸ or prospectors searching for mineralization concealed beneath a cover of soil may not be able to meet the requirement that they have made a discovery of a "valuable mineral deposit" in order to hold their claim under the General Mining Law.¹²⁹

124. 30 U.S.C. §§ 611-615 (1982).

125. *Id.* §§ 612, 613. Section 612 is especially concerned with management of timber resources on unpatented claims. *Id.* § 612(c).

126. *See, e.g.,* United States v. Richardson, 599 F.2d 290 (9th Cir. 1979), *cert. denied*, 444 U.S. 1014 (1980). In *Richardson*, a prospector bulldozed trenches and blasted in an effort to reveal fresh exposures of rock for examination and geochemical sampling. Because the prospector had bulldozed and excavated large areas of the claim, the court held that the prospector's methods were "unnecessary and were unreasonably destructive of surface resources," and enjoined him from continuing his activity. *Id.* at 295.

127. For example, surface activities such as road building may be prohibited in environmentally sensitive areas. The cost of helicopter transport of drilling equipment to the site of potential mineralization may be too great to justify evaluation of potential mineral deposits. Reclamation requirements such as restoring the area to its original contour also may cause undue expense in areas where the federal agency prohibits heavy machinery.

128. The term "explorationist," as used by this Comment, refers to any individual who is professionally trained in exploring for and developing mineral resources. Such individuals include geologists, geophysicists, geochemists and mining engineers. The term "prospector" is meant to refer to individuals who explore for mineral resources but who lack any formal professional training in this field.

129. 30 U.S.C. § 22 (1982 & Supp. III 1985). Although the General Mining Law requires that a claimant make a discovery of a "valuable mineral deposit" to lawfully hold the claim, it is not specific about what constitutes discovery of a "valuable mineral deposit" within the meaning of 30 U.S.C. § 22. Subsequent case law following enactment of the mining law has developed two tests to determine whether a person discovered a "valuable mineral deposit." Under the first test—the "prudent man" test—a "valuable mineral deposit exists where the mineral found is of such quality and quantity that a person of ordinary prudence would be justified in the further expenditure of his labor and means with a reasonable prospect of success in developing a valuable mine." United States v. Parker, 91 Interior Dec. 271, 273 (1984) (citing *Chrisman v. Miller*, 197 U.S. 313, 322-23 (1905); *Castle v. Womble*, 19 Pub. Lands Dec. 455, 457 (1894)).

The second test is the "marketability" test which requires that the prospector be able to extract, remove and market the mineral at a profit. *Parker*, 91 Interior Dec. at 273 (citing *United States v. Coleman*, 390 U.S. 599 (1968)). The controversy over whether a claimant

In 1964, Congress passed the Wilderness Act¹³⁰ to establish a national system for wilderness preservation on federal lands managed by the Department of Agriculture. The system is comprised of congressionally designated areas of 5,000 acres or more. Each area must have an undeveloped character that requires management and protection to preserve that character.¹³¹ The Act effectively withdrew millions of acres of national forest land from mineral exploration by prohibiting all mineral exploration and development in designated wilderness areas after December 31, 1983.¹³² A total of 9.1 million acres was initially designated part of the National Wilderness Preservation System under the Act.¹³³ The Act also gave the Secretary of the Interior authority to review additional roadless areas of more than 5,000 contiguous acres in the national park system and on federal grazing lands, and to recommend to the President additional areas for wilderness designation.¹³⁴

The proposed wilderness areas were subject to recurring evaluations for minerals by the USBM and USGS to "determine the mineral values, if any, that may be present"¹³⁵ After 1984, however, these evaluations became moot because mining on the lands was prohibited. Thus, unless mineralization has been discovered and developed prior to 1984, explorationists have no further opportunity to examine wilderness areas

must meet only one or both requirements for discovery has not been resolved. Judicial interpretations concerning which part of the test should be applied vary. Braunstein, *supra* note 117, at 1169-72.

Regardless of whether the "prudent man" or "marketability" test applies, the aspiring claimant must establish that there is indeed mineralization on his proposed claim, or he may forfeit the right to work the claim. See generally *Parker*, 91 Interior Dec. 271 (evaluating evidence for mineralization on several of prospectors' claims). In the early days of the General Mining Law, this was easily accomplished by examining and sampling the outcroppings of rocks on the land. Today, with the aid of advanced geophysical and geochemical techniques, it is possible to identify potential mineralization tens or even thousands of feet below the surface despite the lack of any surface outcrops of rocks. To actually prove that mineralization exists below the ground surface which satisfies the discovery requirements for staking a claim, the prospector or explorationist must dig trenches through the underlying soil in the case of shallow mineral deposits. To establish the existence of mineralization at deeper levels, it is necessary to drill into and sample the underlying rocks. In either case, construction of access roads, trenches and "drill pads" to accommodate the drilling rigs will create significant surface disturbances that an agency could prevent by strict enforcement of the Surface Resources Act or other similar acts protecting the surface of federal land from undue degradation.

130. 16 U.S.C. §§ 1131-1136 (1982 & Supp. III 1985).

131. H.R. REP. NO. 1538, 88th Cong., 2d Sess., reprinted in 1964 U.S. CODE CONG. & ADMIN. NEWS 3615, 3615-16.

132. 16 U.S.C. § 1133(d)(3) (1982).

133. Bennethum & Lee, *Is Our Account Overdrawn?*, 61 AM. MINING CONG. J. 33, 40 (1975).

134. 16 U.S.C. § 1132(c) (1982).

135. Wilderness Act, 16 U.S.C. § 1133(d)(2) (1982).

for mineralization or to develop any new mineral deposits found there.¹³⁶ By the end of 1974, Congress had set aside, as wilderness areas, a total of 12.6 million acres of the 742 million acres of public land that had been subject to the General Mining Law.¹³⁷

Congress also gave the Department of the Interior similar authority to withdraw lands as wilderness areas and to set aside roadless areas as wilderness study areas when it enacted the Federal Land Policy and Management Act (FLPMA) in 1976.¹³⁸ Under the FLPMA, the Secretary of the Interior is authorized to withdraw land containing 5,000 acres or more, provided that Congress does not disapprove.¹³⁹ The Act also authorizes the Secretary to review additional roadless areas of 5,000 acres or more. The FLPMA also requires the Secretary to submit his recommendations for preservation of additional wilderness areas to the President by October 21, 1991.¹⁴⁰

The FLPMA explicitly provides that it is the policy of the United States to manage public lands "in a manner which recognizes the Nation's need for domestic sources of minerals . . . from the public lands including implementation of the Mining and Minerals Policy Act of 1970 as it pertains to the public lands"¹⁴¹

The FLPMA, however, also declares that lands under review must be managed in such a way as

not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on Oct. 21, 1976: *Provided, That*, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection.¹⁴²

136. See Bennethum & Lee, *supra* note 133, at 40-41.

137. Bennethum & Lee, *supra* note 133, at 34, 40.

138. 43 U.S.C. §§ 1701-1784 (1982 & Supp. III 1985).

139. 43 U.S.C. § 1714(c) (1982). The FLPMA specifies that the Secretary of the Interior's land withdrawals are subject to congressional disapproval. *Id.* Recent case law probably renders this an unconstitutional violation of the separation of powers because the FLPMA allows Congress to veto an action it has delegated to an official of the executive branch. See *Immigration and Naturalization Serv. v. Chadha*, 462 U.S. 919, 1013 (1983) (White, J., dissenting).

140. 43 U.S.C. § 1782(a) (1982).

141. *Id.* § 1701(a)(12) (citations omitted).

142. *Id.* § 1782(c). For a discussion of the Secretary of the Interior's duties under this section, see *Rocky Mountain Oil & Gas Ass'n v. Watt*, 696 F.2d 734 (10th Cir. 1982); *The Bureau of Land Management Wilderness Review and Valid Existing Rights*, 88 Interior Dec. 909 (1981).

Like the Wilderness Act, the FLPMA required examination of the designated wilderness study areas by the USBM and USGS to determine the extent of mineralization on the land prior to withdrawal as wilderness areas.¹⁴³ It is unclear whether the FLPMA, like the Wilderness Act, will suspend all mineral exploration and development on designated wilderness areas.¹⁴⁴

The overall effect of the Surface Resources Act, the Wilderness Act, the FLPMA and other congressional legislation¹⁴⁵ has been to reduce the amount of federal land available for mineral exploration and development. Of the more than two billion acres of land that make up the United States, over 700 million acres remain as public land.¹⁴⁶ In 1965, more than ninety percent of the nation's domestic copper, mercury, silver, molybdenum and potash came from western states which contained over ninety percent of the nation's public lands.¹⁴⁷ By 1974, approximately fifty-three percent of the nation's public land had been withdrawn from exploration and mining activities.¹⁴⁸ Considering the fact that land withdrawals under the FLPMA began two years later in 1976 and will continue until at least 1991, it is likely that a significant percentage of federal land will be withdrawn from the General Mining Law before the turn of the century.

143. 43 U.S.C. § 1782(a) (1982).

144. 43 U.S.C. § 1782(c) states:

Once an area has been designated for preservation as wilderness, the provisions of the Wilderness Act which apply to national forest wilderness areas shall apply with respect to the administration and use of such designated area, including mineral surveys . . . and mineral development, access, exchange of lands, and ingress and egress for mining claimants and occupants.

Id. § 1782(c) (citations omitted). Lands designated as wilderness areas under the FLPMA may be prohibited from all General Mining Law activities as was wilderness land under the Wilderness Act. 16 U.S.C. § 1133(d)(3) (1985). Congress' enactment of the Mining and Minerals Policy Act of 1970 may preclude a total ban on mining of wilderness areas, but to be allowed to mine on a designated wilderness area, a claimant must conduct no more activity on the land than he did on Oct. 21, 1976, and he must not cause any "undue degradation" of the land. 43 U.S.C. § 1782(c) (1982). While § 1782 does not define what "undue degradation" means, it is likely that Congress meant that mining on designated wilderness areas could not unreasonably diminish the wilderness characteristics of the land. The net effect would appear to be the same as applying section 1133(d)(3) of the Wilderness Act—to prohibit all mining.

145. *See, e.g.*, Federal Coal Leasing Amendments Act of 1975, 30 U.S.C. §§ 181 *et seq.* (1982); Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. §§ 1201 *et seq.* (1982).

146. Bennethum & Lee, *supra* note 133, at 34.

147. PUBLIC LAND LAW REVIEW COMMISSION, ONE THIRD OF THE NATION'S LAND 121 (1970).

148. Bennethum & Lee, *supra* note 133, at 36.

b. state regulation of mineral exploration and mining on private land

Not all ore deposits have been found on public land.¹⁴⁹ State and local laws may have a profound effect on whether mining on private land will take place. For example, states may exercise their control over mining on private land by imposing environmental restrictions or by taxing the property or mine production. In the state of Wisconsin, for instance, recent discoveries of zinc-copper deposits on private land have led to an extensive regulatory framework of laws addressing many aspects of mining.¹⁵⁰ The state also enacted a sliding-scale severance tax, based on gross mining revenues, that is among the highest of any state.¹⁵¹

One of the major ore deposits recently discovered in Wisconsin was the Crandon ore deposit. In the early 1970's, exploration companies used airborne geophysical techniques to penetrate the glacial gravels that overlie much of the rock in northern Wisconsin.¹⁵² As a result of its exploration efforts, Exxon Coal and Minerals Company (Exxon) identified a potential ore deposit near Crandon, Wisconsin. Exxon began exploratory drilling in 1975 and found ore grade zinc and copper within a month after the drilling program began.¹⁵³ The process of obtaining the necessary permits to begin mining has taken more than ten years to complete. Since 1975, Exxon has had to file an Environmental Impact Statement,¹⁵⁴ a Mine Waste Disposal Facility Feasibility Report,¹⁵⁵ a Mining Permit Application,¹⁵⁶ an Air Pollution Control Permit Application,¹⁵⁷ a Wisconsin Pollutant Discharge Elimination System Permit Applica-

149. See, e.g., STATE OF WISCONSIN, DEP'T OF NATURAL RESOURCES, PUBLIC SERVICE COMM'N, FINAL ENVIRONMENTAL IMPACT STATEMENT, EXXON COAL AND MINERALS CO. ZINC-COPPER MINE, CRANDON, WISCONSIN 1, fig. 1-3, (Nov. 1986) [hereinafter ENVIRONMENTAL IMPACT STATEMENT].

150. See Evans, *Mining in Wisconsin, Where We've Been; Where We're Going*, 28 WIS. ACAD. REV. 3, 7-8 (Dec. 1981). Among the laws passed by the Wisconsin legislature in response to new mining activity in the state were a comprehensive metal-mine reclamation law, 1973 WIS. LAWS 318; revised environmental laws, 1977 WIS. LAWS 377, 1978 WIS. LAWS 421; a mining taxation law, 1977 WIS. LAWS 31; a mining land leasing law, 1977 WIS. LAWS 253; a mineral exploration law, 1977 WIS. LAWS 422; and a mining tort law, 1979 WIS. LAWS 353. *Id.*

151. See R. DAVIDOFF & R. HURDELBRINK, U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF MINES, TAXATION AND THE PROFITABILITY OF MINERAL OPERATIONS IN SEVEN MOUNTAIN STATES AND WISCONSIN: A HYPOTHETICAL STUDY 14-15 (1983).

152. Evans, *supra* note 150, at 6.

153. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 1.

154. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 1, 3-4; WIS. STAT. ANN. § 23.11 (West 1973 & Supp. 1986).

155. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 3-4 (table 1-2); WIS. STAT. ANN. § 144.44 (West Supp. 1986).

156. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 3-4 (table 1-2); WIS. STAT. ANN. §§ 144.85, 144.86(3) (West Supp. 1986).

tion¹⁵⁸ and a High Capacity Well Approval Application¹⁵⁹ with Wisconsin state agencies. By the end of 1986, Exxon, which was in the final stages of obtaining the necessary permits, announced that it would postpone mining activities on the property until zinc and copper prices increased.¹⁶⁰

The Wisconsin example illustrates some of the problems involved with developing a mine on private land subject to state regulation. While the state regulations have been designed to protect the state's environment, the lengthy and expensive permit process has done little to encourage future exploration and mining in the state.

c. state regulation of mineral exploration and mining on federal land

Conflicts between state and federal laws have arisen over mining activity on federal land. Increased state regulation of activities affecting the environment have clashed with federal policies of developing federal land. For example, in *California Coastal Commission v. Granite Rock Co.*,¹⁶¹ a corporation was engaged in mining limestone from unpatented mining claims in a National Forest located in California.¹⁶² After securing approval of a five-year plan of operations from the United States Forest Service, the company began mining operations in 1981. In 1983, amidst environmentalists' protests against the mining operations, the California Coastal Commission advised Granite Rock Company that since its operations were within the California Coastal Zone, the company would have to obtain a state permit to continue mining.¹⁶³

Granite Rock sued the California Coastal Commission contending that the California Coastal Commission permit requirement was preempted by Forest Service regulations, the General Mining Law of 1872 and the Coastal Zone Management Act.¹⁶⁴ The District Court for the Northern District of California denied Granite Rock's motion for sum-

157. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 3-4 (table 1-2); WIS. STAT. ANN. §§ 144.391, 144.392 (West Supp. 1986).

158. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 3-4 (table 1-2); WIS. STAT. ANN. § 147 *et seq.* (West Supp. 1986).

159. ENVIRONMENTAL IMPACT STATEMENT, *supra* note 149, at 3; WIS. STAT. ANN. § 144.025(2)(e) (West Supp. 1986).

160. Wausau Daily Herald, Dec. 22, 1986, at 3A, col. 4.

161. 107 S. Ct. 1419 (1987).

162. *Id.* at 1422.

163. *Id.* at 1423; *see also* Burling, *Local Control of Mining Activities on Federal Lands*, 21 LAND & WATER L. REV. 33, 35-36 (1986).

164. *Granite Rock Co.*, 107 S. Ct. at 1423.

mary judgment and dismissed the action.¹⁶⁵ The Ninth Circuit Court of Appeals reversed and held that an independent state permit system was preempted by the General Mining Law of 1872 and the Forest Service's permit authority.¹⁶⁶ The United States Supreme Court reversed the Ninth Circuit's ruling and held that the state permit requirements did not conflict with federal law and were, therefore, not preempted.¹⁶⁷ The Court's decision allows a state to regulate mining activities on federal land provided the state's land management regulations do not conflict with those of the federal government. The decision will undoubtedly make it more difficult for mining companies to develop minerals on federal land. The dual regulatory requirements could discourage many individuals and mining companies from ever entering federal land to explore for minerals where state regulations are too costly, difficult or time-consuming to meet.

3. The decline of the mining and mineral industry

Spokesmen for the mining industry often blame federal laws for much of the nation's dependence on strategic mineral imports. Although federal regulations may inhibit domestic mineral production, market forces also contribute to the decreased production of domestic minerals. The strength of the dollar and inexpensive labor abroad have contributed to the United States' increased importation of minerals.¹⁶⁸ During the early part of the 1980's, oil companies purchased many of the prominent domestic mining companies. As a result of the decrease in mineral prices, the oil companies suffered hefty losses.¹⁶⁹ Oil companies were unwilling to invest the huge amounts of money required for mine development at a time when mines were losing millions of dollars annually.¹⁷⁰ Oil company management cut back on both staff and operations and tried to sell their interests in the mining industry.¹⁷¹ Consequently, domestic mineral production decreased and many owners closed their mines.

165. *Id.* (citing *Granite Rock Co. v. California Coastal Comm'n*, 590 F. Supp. 1361 (N.D. Cal. 1984)).

166. *Id.* (citing *Granite Rock Co. v. California Coastal Comm'n*, 768 F.2d 1077, 1083 (9th Cir. 1985)).

167. *Id.* at 1424.

168. Houston, *supra* note 107, at 65-66.

169. *Id.* at 65.

170. See, e.g., *id.* at 70. Three years after Standard Oil Co. of Ohio (Sohio) acquired the Bingham Canyon copper mine in Utah, Sohio began to reconsider its plans for investing one billion dollars to modernize the mine. *Id.*

171. Houston, *supra* note 107, at 65; II UNITED STATES DEPT. OF THE INTERIOR, BUREAU OF MINES, MINERALS YEARBOOK at 120 (1986).

4. The future of domestic production of strategic minerals

The United States may never be self-sufficient in producing many of the strategic minerals that it needs. Additionally, this country has aggravated its plight by withdrawing land from mineral exploration and development by placing environmental concerns ahead of concerns over mineral vulnerability and by continuing to buy minerals from foreign sources rather than supporting its own mining industry. Furthermore, state laws have imposed even greater restrictions on mining on private land. Conflicts between state and federal regulations have caused delays and cessation of mining activities on federal land until the conflicts can be resolved. Finally, the mining industry has not met the challenge from foreign competitors and has, as a result, suffered severe economic harm. At this point in time, the future of mining in this country is in serious doubt. The United States, however, can adopt measures that could alleviate its dependence on strategic mineral imports.

B. Decreased Domestic Consumption of Strategic Minerals

By decreasing domestic consumption of strategic minerals, the United States can help achieve independence from strategic mineral imports. Conservation measures such as recycling of minerals and substitution of alternate materials for materials now composed of strategic minerals could reduce domestic consumption.

1. Conservation

Conservation of strategic minerals has been a part of United States strategic mineral policy since the enactment of the Strategic and Critical Materials Stock Piling Act of 1946.¹⁷² Recently, Congress emphasized conservation measures when it passed the National Materials and Minerals Policy, Research and Development Act of 1980.¹⁷³ Congress authorized the President to support basic and applied research and development to "improve[] methods for the extraction, processing, use, recovery, and recycling of materials which encourage the conservation of materials, energy, and the environment"¹⁷⁴

A program of new processing and manufacturing technologies which increase production, save materials and improve efficiency of performance could increase conservation of strategic materials. New and

172. Ch. 590, 60 Stat. 596, 596 (1946) (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)).

173. 30 U.S.C. §§ 1601-1605 (1982).

174. *Id.* § 1603(2)(C).

improved processes in the manufacture of steel and alloys could save both energy and strategic minerals.¹⁷⁵ Development of mechanical or electrical parts requiring smaller quantities of strategic minerals or of parts which last longer could help reduce demand for strategic minerals.¹⁷⁶

2. Recycling

Recycling differs from other forms of conservation because it helps to increase available mineral supplies.¹⁷⁷ Recycling has been a part of United States strategic mineral policy since 1970 when Congress declared that "[t]he time has passed when we can continue to ignore the need for better utilization of wornout and castoff metal and mineral products. We must begin to mine our scrap piles."¹⁷⁸

While recycling has been incorporated as a part of United States strategic mineral policy in both the Mining and Minerals Policy Act of 1970¹⁷⁹ and the National Materials and Minerals Policy, Research and Development Act of 1980,¹⁸⁰ no federal legislation has been enacted by Congress that mandates the development of a major strategic minerals recycling industry.¹⁸¹ Because there is no effective federal recycling policy, the responsibility has fallen on private industry to recycle when it is economically and technologically feasible to do so.¹⁸² Since prices and availability of strategic minerals have remained relatively stable in recent years,¹⁸³ there is currently little incentive for private industry to develop recycling programs to recover strategic minerals.

Shortages or sharp increases in strategic mineral prices could provide the incentive private industry needs to increase its recycling efforts. For example, as a result of the Canadian nickel strike in 1969 and the sharp increase in the world cobalt price in 1978, U.S. industry nearly

175. OTA REPORT, *supra* note 9, at 216.

176. *Id.* at 216-17.

177. *Id.* at 215.

178. H.R. REP. NO. 1442, 91st Cong., 2d Sess., *reprinted in* 1970 U.S. CODE CONG. & ADMIN. NEWS 5792, 5794.

179. 30 U.S.C. § 21a (1982).

180. 30 U.S.C. § 1603(2)(C) (1982).

181. See OTA REPORT, *supra* note 9, at 375. Federal recycling programs have concentrated on research and development of recycling processes, but there has been a lack of interest by private industry to adopt expensive new recycling technology without economic incentives. *Id.* at 376-78. Economic incentives might include federal subsidies, state or federal tax credits or deductions, or lower prices for scrap as compared to buying the minerals from foreign sources.

182. See OTA REPORT, *supra* note 9, at 372, 377.

183. See generally Gibson, *No One's Pet Rocks: Why Strategic Metals Have Fallen From Favor*, *Barron's*, Oct. 3, 1983, at 8, col. 1.

tripled its consumption of nickel scrap in three years and doubled its consumption of cobalt scrap within one year.¹⁸⁴ Recycling is also a viable means of satisfying the United States' increasing need for platinum.¹⁸⁵

3. Substitution for strategic minerals

The idea of finding substitutes for strategic minerals to reduce dependency on foreign strategic mineral imports is not new.¹⁸⁶ With the passage of the National Materials and Minerals Policy, Research and Development Act of 1980 and the National Critical Materials Act of 1984, the United States has placed greater emphasis on researching and developing new technologies, improving efficient use of strategic minerals and discovering new substitutes for strategic minerals to lessen its dependence on strategic minerals.¹⁸⁷

While the United States could reduce its need for some vital strategic minerals by using substitute materials,¹⁸⁸ not all strategic minerals can be replaced.¹⁸⁹ Also, research and development of adequate substitutes for strategic minerals is time consuming and expensive. The research and development effort could take ten or more years and cost millions of dollars.¹⁹⁰ American manufacturers are unlikely to engage in such research and development unless it will result in lower costs, better

184. See OTA REPORT, *supra* note 9, at 257.

185. SIERRA RESEARCH AND ENERGY AND ENVIRONMENTAL ANALYSIS, INC., OFFICE OF TECHNOLOGY ASSESSMENT WORKING PAPER, CRITICAL METAL CONSUMPTION IN AUTOMOBILE CATALYSTS: TRENDS AND ALTERNATIVES 1 (1983) (CIS J952-53 1985). Automobile emission controls are now consuming over 800,000 troy ounces of platinum or about 25 or 30% of all platinum group metals this nation imports. Platinum use in automotive emission controls is expected to increase by 80% over the next decade. As much as one half of the platinum used by the United States could be recycled by the mid 1990's. However, accomplishing this will require a concerted effort from government and private industry. *Id.*

186. See Strategic and Critical Materials Stock Piling Act of 1946, Ch. 590, 60 Stat. 596, 599-600 (codified as amended at 50 U.S.C. §§ 98-98h (1982 & Supp. III 1985)). The Defense Production Act of 1950 was also amended in 1955 to include this provision: "When in his judgment it will aid the national defense, the President may make provision for the development of substitutes for strategic and critical materials." 50 U.S.C. app. § 2093(g) (1982).

187. See National Materials and Minerals Policy, Research and Development Act of 1980, 30 U.S.C. § 1603(2)(D) (1982); National Critical Materials Act of 1984, 30 U.S.C. §§ 1801(b), 1804, 1805 (Supp. III 1985).

188. OTA REPORT, *supra* note 9, at 266. The authors estimated that one-third of the nation's chromium demand could be eliminated through the use of immediately available substitutes. *Id.*

189. *Id.* at 266-67. The steel making industry has no adequate substitute for manganese as an additive in steel. Until researchers develop new processes that will reduce the amount needed to produce steel, manganese will remain an essential ingredient for making the metal. See *id.* at 27, 55, 266.

190. *Id.* at 267.

performance and new market penetration.¹⁹¹ The federal government's objectives of reduced import consumption, materials conservation and maintenance of national industrial competitiveness may conflict with American industry objectives.¹⁹² American industry may be unwilling to support a federal policy of materials substitution research unless the industry benefits economically.

While the federal government has sponsored many research and development programs for strategic mineral substitutes, industry has been reluctant to use strategic mineral substitutes in its commercial manufacturing unless clear benefits exist in terms of cost and performance.¹⁹³ Dependence on strategic minerals for most of this nation's present uses is likely to continue unless the government takes steps to apply its strategic minerals substitution projects to large scale manufacturing settings, or until American manufacturers realize that using substitutes for strategic minerals leads to economic benefits.

C. *Alternative Sources for Strategic Minerals*

The United States has few options to attain independence from foreign imports—especially since domestic programs cannot adequately achieve this goal. If imports are necessary, one possible solution is to diversify foreign strategic mineral sources. Another alternative which may create less dependence on other nations is to obtain many of our strategic minerals from the sea floor.

1. Diversification of strategic mineral supply among multiple foreign sources

Because the United States relies on a small number of countries for most of its strategic mineral imports, serious disruptions in the United States' strategic mineral supplies could result from a single country's failure to provide strategic minerals.¹⁹⁴ By relying on a large number of foreign countries for its strategic mineral requirements, the United States

191. *Id.* at 265-67.

192. *Id.*

193. *Id.* at 267. The Department of Energy, USBM and NASA sponsor strategic mineral substitute programs. These programs, however, are years and millions of dollars away from completion. *Id.*

194. Over 99% of the world's chromium resources are located in southern Africa. MINERAL COMMODITY SUMMARIES 1986, *supra* note 2, at 35. Between 1981 and 1984, 67% of the chromium the United States imported came from South Africa and Zimbabwe. *Id.* at 34. The United States imported between 76 and 90% of the chromium that it needed during this period. The United States also depends on approximately 20 countries for nearly all of its columbium, manganese, mica, strontium, bauxite, cobalt, platinum and tantalum. *See id.* at 2.

could diversify its sources of strategic minerals. Because countries like South Africa and Zaire hold a virtual monopoly on platinum, cobalt, manganese and chromium, it would be prudent for the American government to encourage other nations to explore for and develop strategic minerals which meet the nation's needs. This alternative is, however, subject to failure when political changes in developing countries erase mining investments which cost millions of dollars and take years of work.¹⁹⁵ The expense and time involved in developing new mineral resources presents another complication—investors may be unwilling to wait years for an uncertain return on their investment.¹⁹⁶ Thus, investment by private industry in developing mineral deposits overseas has declined during the last twenty years.¹⁹⁷

Despite the uncertainties in foreign mining investment, U.S. strategic mineral policy has not ignored the idea of diversifying foreign sources for its strategic minerals. The National Materials and Minerals Policy, Research and Development Act of 1980 requires that the United States seek multilateral and bilateral agreements with other nations to ensure adequate strategic material supplies.¹⁹⁸ Both the USBM and USGS are actively engaged in assessing strategic mineral resources of foreign nations.¹⁹⁹ The Reagan Administration has also encouraged international strategic mineral development through the Trade and Development Program of the International Development Cooperation Agency.²⁰⁰ Funding levels for this program, however, have been too low to produce a significant amount of diversification.²⁰¹ So far, efforts by President Reagan and Congress to diversify strategic mineral sources have been

195. OTA REPORT, *supra* note 9, at 357. During the late 1940's and early 1950's, the United States, in an attempt to diversify its nickel market, tried to help develop Cuba's nickel resources. The attempt succeeded but the United States was never able to reap the rewards of its investment after the Castro regime took control of Cuba. *Id.*

196. *Id.* Once a mineral deposit has been discovered, a mine developer will need at least two to five years to develop a mine and to begin mineral production. The total cost from exploration to production could exceed a billion dollars. *Id.*

197. *Id.*

198. National Materials and Minerals Policy, Research and Development Act of 1980, 30 U.S.C. § 1603(9) (1982). Under the Act, the President shall, through his executive agencies, "assess the opportunities for the United States to promote cooperative multilateral and bilateral agreements for materials development in foreign nations for the purpose of increasing the reliability of materials supplies to the Nation." *Id.*

199. Under the National Materials and Minerals Policy, Research and Development Act, "[t]he Secretary of the Interior shall promptly initiate actions to . . . improve the capacity of the Bureau of Mines to assess international minerals supplies . . ." *Id.* § 1604(e)(1); *see also* OTA REPORT, *supra* note 9, at 357-58.

200. OTA REPORT, *supra* note 9, at 358.

201. *Id.*

unsuccessful.²⁰²

2. Sea floor mining

During the 1870's, scientific expeditions discovered manganese nodules on the sea floor.²⁰³ Since then, private industry and government have taken an increasing interest in mining the sea floor. In the last thirty years, technology has advanced sufficiently to make sea floor mining feasible. The recent discovery of copper-nickel-cobalt deposits along oceanic spreading centers²⁰⁴ has increased international interest in mining sea floor deposits.

Congress, realizing that sea floor mineral resources could potentially reduce U.S. strategic mineral dependence, enacted the Deep Seabed Hard Mineral Resources Act in 1980.²⁰⁵ Through the Act, Congress endorsed the goals of the United Nations Conference on the Law of the Sea Treaty.²⁰⁶ Specifically, Congress affirmed the Treaty's objective of providing a new international legal order for exploration and commercial recovery of mineral resources from the sea floor.²⁰⁷

In 1982, after eight years of negotiations, the Law of the Sea Treaty was signed by 117 nations.²⁰⁸ President Reagan, however, refused to add

202. *Id.* at 358-61.

203. Briscoe & Lambert, *Seabed Mineral Discoveries Within National Jurisdiction and the Future of the Law of the Sea*, 18 U.S.F. L. REV. 433, 443 (1984).

204. *Id.* at 433-34. Oceanic spreading centers are areas on the ocean floor where the oceanic crustal plates are pulling apart from each other. Molten magma wells up in the cracks where the crustal plates have pulled apart, and the interaction of the seawater with the molten magma forms mineral deposits. Ballard & Grassle, *Incredible World of the Deep-sea Rifts*, 156 NAT'L GEOGRAPHIC 680, 688, 702-03 (1979).

205. 30 U.S.C. §§ 1401-1473 (1982 & Supp. III 1985). Congress stated in section 1401(a) of the Act that:

(1) the United States' requirements for hard minerals to satisfy national industrial needs will continue to expand and the demand for such minerals will increasingly exceed the available domestic sources of supply;

(2) in the case of certain hard minerals, the United States is dependent upon foreign sources of supply and the acquisition of such minerals from foreign sources is a significant factor in the national balance-of-payments position;

(3) the present and future national interest of the United States requires the availability of hard mineral resources which is independent of the export policies of foreign nations;

(4) there is an alternate source of supply, which is significant in relation to national needs, of certain hard minerals, including nickel, copper, cobalt, and manganese, contained in the nodules existing in great abundance on the deep seabed . . .

30 U.S.C. § 1401(a)(1)-(4) (1982).

206. *Id.* § 1401(a)(7)-(8).

207. *Id.* § 1401(a)(8).

208. Richardson, *Superpowers Need Law: A Response to the United States Rejection of the Law of the Sea Treaty*, 17 GEO. WASH. J. INT'L L. & ECON. 1, 1 (1982). Although the Law of the Sea Treaty was signed by 117 nations, the Treaty will not come into force until 12 months

his signature²⁰⁹ to the Treaty because he was unhappy with the deep seabed mining provisions. However, he did not specifically state his objections to those provisions.²¹⁰

Although the United States has established a national policy for deep seabed mining, President Reagan's failure to sign the Law of the Sea Treaty has caused some mining companies to refrain from mining the seabed beyond the United States' 200 mile exclusive economic zone.²¹¹ American industry may be reluctant to invest money in a mining operation that may be illegal under domestic law.²¹² Furthermore, American mining companies will be unwilling to invest hundreds of millions of dollars in sea floor mining when their rights to mine sea bed minerals in waters outside the jurisdiction of the United States may not be recognized by countries abiding by the provisions of the Law of the Sea

after the Treaty has been ratified by the sixtieth country. United Nations Convention on the Law of the Sea, Dec. 10, 1982, art. 308, U.N. Doc. A/CONF.62/122 (1982) [hereinafter UNCLOS]. As of Oct. 20, 1986, only 31 countries had ratified the Treaty. 2 K. SIMMONDS, *NEW DIRECTIONS IN THE LAW OF THE SEA* U.3, 1 (1987) (citing U.N. Doc. A/41/742 at 5 (1986)).

209. Richardson, *supra* note 208, at 1.

210. *Id.* The President's refusal to sign the treaty may have had to do with his concern over subjecting United States economic activity to control by a supranational body. *Id.* at 2 n.6 and accompanying text. Although the Law of the Sea Treaty establishes broad policy-making authority in a "one nation, one vote" Assembly, a 36-member executive Council would make most daily decisions concerning seabed mining. Malone, *Who Needs the Sea Treaty?*, 54 FOREIGN POL'Y 44, 53 (1984); see also UNCLOS, *supra* note 208, art. 159-62.

James Malone, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs and Special Representative of President Reagan to the Law of the Sea Conference, has argued that the United States does not have adequate representation on the executive Council in proportion to the amount of financial support this country would be required to provide and to the interest it has in being one of the few countries capable of actually mining the seabed. Malone, *supra*, at 53. Additionally, Malone indicated that the Reagan Administration views the seas as "belonging to no country or individual but open to those willing to take the risk and invest the labor necessary to derive benefit from the abundant resources the seas contain . . ." *Id.* at 45. Malone contrasted the U.S. view with UNCLOS' "distorted interpretation of the noble concept of the Earth's vast oceans as the 'common heritage of mankind.'" *Id.*

211. See *infra* note 213 and accompanying text. Although the United States has not signed the Law of the Sea Treaty, it has claimed a 200 mile exclusive economic zone similar to that of UNCLOS. Proclamation No. 5030, 48 Fed. Reg. 10,605 (1983). The exclusive economic zone as described in UNCLOS recognizes the coastal State's "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, . . . of the sea-bed and its subsoil . . ." UNCLOS, *supra* note 208, art. 56(1)(a). "The exclusive economic zone shall not extend beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured." *Id.* art. 57.

212. Section 1411 of the Deep Seabed Hard Mineral Resources Act, 30 U.S.C. §§ 1401-1473 (1982 & Supp. III 1985), prohibits any U.S. citizen from engaging in any exploration or commercial recovery without a license or permit issued by the United States or reciprocating state, or by international agreement unless such an agreement is in force with respect to the United States. 30 U.S.C. § 1411(a)(1) (1982).

Treaty.²¹³ Thus, until there is international agreement on seabed mining rights, it is unlikely that the United States can rely on seabed mining to reduce its dependence on strategic mineral imports.

V. LOSS OF AMERICAN MINERAL PROCESSING CAPABILITY: A NEW FACTOR AFFECTING U.S. STRATEGIC MINERAL VULNERABILITY

Until recently, the United States either produced or imported the strategic minerals it needed and then processed the raw minerals into alloys. During the last decade, however, the United States has become increasingly dependent on foreign sources, not only for its strategic minerals, but for processed materials made from strategic minerals.²¹⁴ The foreign processed materials have enjoyed a competitive edge over their American counterparts, possibly because of lower labor and production costs.²¹⁵ As a result, many American industries that once processed raw imported strategic minerals have now gone out of business.²¹⁶ The danger resulting from this trend is that even if the United States has the

213. Richardson, *supra* note 208, at 12. Elliott Richardson, former Chairman of the U.S. Delegation to the Third U.N. Conference on the Law of the Sea, 1977-80, was not optimistic about the prospect of U.S. industry engaging in seabed mining without an international agreement:

Will U.S. companies have the opportunity to engage in deep seabed mining outside the treaty? The clear answer is no. To accept the notion that assured access to the deep seabed beyond the limits of national jurisdiction might somehow be afforded by a reciprocating states agreement or mini-treaty is sheer folly. I know of no one who believes that a nickel will ever be invested by U.S. companies on a legal foundation resting solely on U.S. legislation purporting to authorize deep seabed mining outside the Treaty. The right to mine in extraterritorial waters is a matter of international law, and a version of international law that is not widely accepted would be a frail reed on which to risk a billion dollars or more.

Id. (footnote omitted).

Richardson's prediction may be accurate. Seabed mining rights are developing along two tracks: (1) those nations adhering to UNCLOS and (2) nations like the United States who are developing separate agreements with other nations who have not signed or ratified UNCLOS. J. BROADUS, SEABED MINING, REPORT TO OFFICE OF TECHNOLOGY ASSESSMENT 2 (1984) (Office of Technology Assessment Working Paper) (CIS J952-58 1985). By 1984, several major companies previously engaged in developing technology to mine seabed minerals had withdrawn altogether or had declined to make further expenditures. *Id.* at 1. Consortia, still engaged in seabed mining development, restricted their efforts to acquiring assured access to preferred prospective mining sites on the seabed either through one or the other mining rights tracks. *Id.* at 2. For a discussion of the political, economic and security risks associated with unilateral deep seabed mining, see Jones, *Risk Assessment: Corporate Ventures in Deep Seabed Mining Outside the Framework of the UN Convention on the Law of the Sea*, 16 OCEAN DEV. & INT'L L. 341 (1986).

214. OTA REPORT, *supra* note 9, at 44-45, 136-37.

215. *Id.*

216. *Id.*

strategic minerals in its stockpile during times of crisis, it may not have the manufacturing capability to produce the needed materials from the stockpiled minerals.²¹⁷

Foreign imports of processed strategic minerals have greatly affected the ferroalloys industry in America. Before manganese ore can be added to the steel making process, it must be made into a ferroalloy called ferromanganese.²¹⁸ In 1974, the United States produced approximately seventy percent of its ferromanganese requirements.²¹⁹ By 1983, United States ferromanganese production had decreased to approximately seven percent of domestic consumption.²²⁰ From 1981 to 1984, South Africa provided thirty-nine percent of the ferromanganese imported by the United States.²²¹ Heavy reliance on one country for materials manufactured from strategic minerals may increase the United States' vulnerability to supply cutoffs or sharp price increases. The problem is further compounded where the foreign nation producing the materials made from strategic minerals is also the dominant producer of the mineral itself. The problem is especially apparent in the case of American reliance on South Africa for ferromanganese made from South African manganese.

While Japan and European countries have taken steps to preserve key industries such as the ferroalloys industry, the United States has done little to prevent such industries from deteriorating.²²² Furthermore, the United States may not appreciate how much it actually relies on foreign nations for materials manufactured from strategic minerals. Currently, there does not appear to be an accurate accounting of the quantity of strategic minerals imported by the United States in the form of both processed and manufactured goods.²²³ As a result, the United

217. *Id.*; see also *Geopolitics*, *supra* note 21, at 185 (statement of A.L. Bement, Jr., Vice President, Technical Resources, TRW Inc.), 354 (statement of A.E. Eckes, Chairman, U.S. Int'l Trade Comm.).

218. *Geopolitics*, *supra* note 21, at 142 (statement of John P. Trunzo, President, Elkem Metals Co.).

219. *Id.* at 142-43.

220. *Id.*

221. MINERAL COMMODITY SUMMARIES 1986, *supra* note 2, at 98.

222. *Geopolitics*, *supra* note 21, at 124 (statement of George Watson, President, The Ferroalloys Association). While the United States has been engaged in upgrading the strategic mineral stockpile with ferromanganese, it may fall short of meeting the nation's requirements in times of national emergency. *Id.* at 125.

223. See Letter from Dr. William Dresher to Larry Bradfish (Sept. 16, 1986) (copy on file at Loyola of Los Angeles Law Review Office). Dr. Dresher is President of International Copper Research Association, Inc. and was a member of President Reagan's Strategic Minerals Task Force formed as part of the Transition Team when President Reagan was elected. Dr. Dresher suggests that the focus of strategic mineral vulnerability should be on the loss of domestic

States may be ignoring a crucial factor in its strategic mineral policy. The loss of industries like the ferroalloys industry, accompanied by this nation's increasing dependence on materials containing strategic minerals that are manufactured outside the United States, could result in a serious increase in U.S. strategic mineral vulnerability.

VI. HUMAN RIGHTS AND U.S. FOREIGN POLICY

The role of human rights in U.S. foreign policy has been a subject of increasing debate in this country during the last ten years.²²⁴ On one side are those who believe that human rights are the internal affairs of individual nations. Accordingly, they argue that the United States should not interfere with other countries' human rights decisions and American foreign policy should not be influenced by human rights considerations.²²⁵ On the other side are those who want the United States to impose strict sanctions on countries that deprive their citizens of human rights.²²⁶ Advocates of this latter approach would argue that U.S. foreign policy should revolve around human rights considerations. The middle ground is occupied by those who believe that decisionmakers should formulate U.S. foreign policy by balancing human rights considerations against the nation's national security and economic interests.²²⁷

Although the views of most U.S. decisionmakers occupy the middle ground of the human rights debate,²²⁸ there are a number of problems associated with balancing human rights concerns with other interests. One problem is that the term "human rights" means different things to different people. For example, human rights could be limited to personal and legal rights, or they could also include political and economic rights.²²⁹ Another problem is raised by the issue of whether human

manufacturing capability rather than on the nation's dependence on strategic mineral imports.
Id.

224. Bite, *Human Rights and U.S. Foreign Policy* 1, LIBR. OF CONGRESS, CONG. RESEARCH SERVICE (Issue Brief No. IB81125) (updated Nov. 24, 1982).

225. *Id.*

226. *Id.*

227. *Id.* at 4-5.

228. *Id.*

229. The Carter Administration's human rights standards were criticized by one author as being broader than those standards used by Amnesty International and previous U.S. foreign policy statements:

[H]uman rights were defined not in terms of personal and legal rights—freedom from torture, arbitrary imprisonment, and arrest, as in usage of Amnesty International and the U.S. Foreign Assistance Acts of 1961 and 1975—but in accordance with a much broader conception which included the political "rights" available only in democracies and the economic "rights" promised by socialism (shelter, food, health, education).

rights standards should be uniformly applied toward both friends and foes of the United States.²³⁰ There is also disagreement among decisionmakers about whether Congress or the President should implement human rights policy.²³¹

While the human rights issue was given a low priority by both the Nixon and Ford Administrations, the Carter Administration made human rights a "hallmark of its international strategy."²³² The Reagan Administration, however, reduced the role of human rights considerations in deciding foreign policy.²³³ Early in President Reagan's first term, the United States adopted a policy of quiet diplomacy as a means of encouraging human rights in other countries.²³⁴ The United States was concerned with strengthening itself and its allies "against the spread of totalitarian aggression."²³⁵ In a speech before the Trilateral Commission in Washington on March 31, 1981, then Secretary of State Alexander Haig outlined the imperatives of the Reagan human rights policy:

The *first* imperative is to strengthen the United States, its allies and friends, the main safeguard against the spread of totalitarian aggression.

Second, we must improve our own example as a society dedicated to justice.

Third, we should adopt a sense of proportion in dealing with violators—the authoritarian versus the totalitarian regime.

Fourth, and finally, it is imperative that we examine the credentials and program of the opposition as well as the government—we must see clearly what change portends for human rights in the future. . . .²³⁶

The third imperative of the Reagan Administration—that of distinguishing between totalitarian and authoritarian regimes when the United States implements its human rights policy—had been previously proposed by Jeane Kirkpatrick, professor of government at Georgetown University. Kirkpatrick, who later became U.S. Ambassador to the United Nations under the Reagan Administration, suggested that when weighing human rights considerations in formulating foreign policy to-

Kirkpatrick, *U.S. Security & Latin America*, 71 COMMENTARY 29, 32-33 (Jan. 1981).

230. Bite, *supra* note 224, at 4.

231. *Id.* at 4-5.

232. Rubin, *Carter, Human Rights, and U.S. Allies*, in HUMAN RIGHTS AND U.S. FOREIGN POLICY 109, 110-11 (B. Rubin & E. Spiro eds. 1979).

233. Bite, *supra* note 224, at 2.

234. *Id.* at 2.

235. *Id.*

236. *Id.*

ward a particular country, the United States should give greater deference to authoritarian rather than totalitarian regimes because

[t]raditional [noncommunist] autocrats leave in place existing allocations of wealth, power, status, and other resources They do not disturb the habitual rhythms of work and leisure, habitual places of residence, habitual patterns of family and personal relations. Because the miseries of traditional life are familiar, they are bearable to ordinary people who, growing up in the society, learn to cope, as children born to untouchables in India acquire the skills and attitudes necessary for survival in the miserable roles they are destined to fill.²³⁷

The United States applied its quiet diplomacy approach toward South Africa under the policy labelled "constructive engagement."²³⁸ A primary purpose of constructive engagement was to steer the United States " 'between the twin dangers of abetting violence in the Republic and aligning [itself] with the cause of white rule,' [and] then . . . contribute to the achievement of change in South Africa."²³⁹ President Reagan affirmed U.S. support of South Africa as " 'a country that has stood beside us in every war we've ever fought, a country that strategically is essential to the free world in its production of minerals.' "²⁴⁰

As early as 1981, however, the Reagan Administration, amidst public and congressional criticism of its human rights policy, began to embrace the human rights issue as a part of its rhetoric. President Reagan stated that " 'the promotion of liberty has always been a central element of our Nation's foreign policy. In my administration, human rights considerations are important in all aspects of our foreign policy.' "²⁴¹ Despite the apparent shift in emphasis on human rights from the selective

237. Kirkpatrick, *Dictatorships and Double Standards*, 68 COMMENTARY 34, 44 (Nov. 1979).

238. Ungar & Vale, *South Africa: Why Constructive Engagement Failed*, 64 FOREIGN AFF. 234, 234 (1985-86).

239. *Id.* at 238 (quoting Chester A. Crocker, Assistant Secretary of State for African affairs for President Reagan).

240. *Id.* at 240.

241. *Bite*, *supra* note 224, at 3. Other Reagan Administration officials voiced statements similar to President Reagan's:

Under this Administration, the protection and enhancement of human rights is a principal goal of our foreign policy. Indeed, it shapes the fundamental purposes and helps define the context of our international relationships

We believe that human rights practices are an important factor in our relationship with other countries, and we Americans believe that when things are wrong, they should be set right—that is our duty to help. Our law and our policy reflect these deep feelings and draws strength and inspiration from them.

As the spokesman for the American people, this Administration opposes the violation of human rights whether by ally or adversary, friend or foe. Ours is not a

approach outlined by then Secretary of State Alexander Haig earlier in 1981²⁴² to the more active approach trumpeted by the Reagan Administration in late 1981,²⁴³ the United States continued to apply its policy of constructive engagement to South Africa and to vacillate in its support of another noncommunist autocracy, Chile.²⁴⁴ Meanwhile, the Reagan Ad-

policy of "selective indignation." Rather it is one of balanced and even-handed condemnation of human rights violations wherever they occur.

Id. (quoting testimony of Walter Stoessel, Jr., Under Secretary of State for Political Affairs, before the House Foreign Affairs Committee, July 14, 1981).

Concern by the Reagan Administration over criticism of its human rights policy prompted Elliott Abrams, Assistant Secretary of State for Human Rights and Humanitarian Affairs, to issue an internal State Department memorandum stating that:

Congressional belief that we have no consistent human rights policy threatens to disrupt important foreign policy initiatives. Human rights has been one of the main avenues for domestic attack on the Administration's foreign policy.

....

A human rights policy means trouble, for it means hard choices which may adversely affect certain bilateral relations. At the very least, we will have to speak honestly about our friends' human rights violations and justify any decisions wherein other considerations economic, military etc., are determinative. There is no escaping this without destroying the credibility of our policy, for otherwise we would simply [be] coddling friends and criticizing foes. Despite the costs of such a human rights policy, it is essential.

Bite, supra note 224, at 3-4 (quoting Nov. 5, 1981 N.Y. Times article of excerpts from Abrams' internal State Department memorandum).

242. See *supra* note 236 and accompanying text.

243. Jacoby, *The Reagan Turnaround on Human Rights*, 64 FOREIGN AFF. 1066, 1070-71 (1986).

244. *Id.* at 1080, 1085. While the Reagan Administration appeared to reject quiet diplomacy as the only method for bringing about reforms in the human rights situation in Chile, it wavered, taking two steps backward for every one it moved ahead, voting against Chilean dictator General Augusto Pinochet at the Inter-American Human Rights Commission and then voting for him, condemning him at the U.N. Human Rights Commission but then allowing the World Bank and the IMF to proceed with plans for loans.

Id. at 1085.

Chile controls more than 25% of the world's known copper reserves. Houston, *supra* note 107, at 67. Chile depends on its state-run mining company, Corporacion Nacional del Cobre de Chile (CODELCO) for 46% of its foreign exchange. In 1983, Chile provided the United States with 46% of the copper it imported and 15% of all the copper used by American manufacturers. *Id.*

The United States has helped finance Chile's policy of suppressing human rights through this nation's continued importation of Chilean copper. Ten percent of Chile's copper revenues are diverted by government decree to the armed forces. *Id.* Chile's armed forces as well as its uniformed and secret police are involved in suppressing human rights. *Human Rights in Chile, supra* note 21, at 50 (statement of John Healey, Executive Director, Amnesty Int'l USA). The armed forces' human rights violations have not been confined to Chile. In 1976, Chilean exile Orlando Letelier and an American associate were killed in a car bomb explosion in Washington D.C. A District of Columbia grand jury indicted three Chileans on charges of murder and conspiracy to commit murder. N.Y. Times, Mar. 26, 1987, at A6, col. 1. The three included General Juan Manuel Contreras Sepúlveda, chief of the intelligence police, Colonel Pedro Espinoza Bravo, operations director of the intelligence police, and Major Armando Fernández

ministration attacked the human rights record of the procommunist Sandinista government in Nicaragua while it defended the tarnished human rights record of the non-communist anti-Sandinista rebels.²⁴⁵ When a South Korean airliner was shot down by the Soviet Union after it entered Soviet airspace in 1983, President Reagan accused Moscow of violating the human rights of the people on board the plane.²⁴⁶

The apparent double standard in the Reagan human rights policy toward communist and non-communist countries may be the result of the definition of human rights adopted by the Reagan Administration and the way it chose to implement its policy for geopolitical, rather than humanitarian, purposes. The Reagan Administration narrowly defined "human rights" to include political rights and civil liberties, but not economic rights.²⁴⁷ Thus, the Reagan Administration might not have been as willing to condemn a country who deprived its citizens of food, shelter, medicine and education,²⁴⁸ viewing these as "aspirations" rather than as rights guaranteed to citizens by the state.²⁴⁹

Additionally, in balancing human rights considerations against other U.S. interests, the Reagan Administration may have felt that geopolitical concerns outweighed humanitarian concerns. For example, to the Reagan Administration, the danger of destabilizing nations friendly to the United States may have outweighed the danger posed by their human rights violations.²⁵⁰ Carried to an extreme, this may have included using the human rights issue as a pawn in a propaganda war against the communist bloc as well as for quelling domestic criticism of its human rights policy.²⁵¹

Regardless of the motives behind the Reagan Administration's policy toward human rights, the human rights situation in South Africa continued to deteriorate.²⁵² South Africa's formation of a tricameral parliamentary system in 1983 excluded blacks and coincided with an unprecedented outburst of violence that led to imposition of a state of emer-

Larios. *Id.* Major Fernández resigned from the army in January 1987 and flew to the United States to plead guilty to the charge of being an accessory to the death of Letelier. *Id.*

245. Jacoby, *supra* note 243, at 1079.

246. *Id.* at 1076.

247. Bite, *supra* note 224, at 4; see also Jacoby, *supra* note 243, at 1071.

248. See *supra* note 229 and accompanying text.

249. Bite, *supra* note 224, at 4.

250. Jacoby, *supra* note 243, at 1078.

251. See generally *id.*

252. Ungar & Vale, *supra* note 238, at 249-50; see also Jacoby, *supra* note 243, at 1080-81; *U.S. Policy on South Africa: Hearing Before the Subcomm. on African Aff. of the Comm. on Foreign Rel., U.S. Senate*, 98th Cong., 2d Sess. 2 (1984) (statement of Sen. Edward Kennedy) [hereinafter Kennedy statement].

gency.²⁵³ Deaths, detentions and disappearances of hundreds of South African blacks at the hands of South African authorities increased.²⁵⁴ In March 1985, South African police opened fire on 4000 demonstrators.²⁵⁵ As with South Africa, the Reagan Administration's policy of using quiet diplomacy to effect changes in Chile's human rights policy also failed as General Pinochet tightened his control over the country.²⁵⁶

By 1985, under pressure from Congress, President Reagan, through an executive order, imposed restrictions on trade between the United States and South Africa.²⁵⁷ The restrictions appeared to be too little too late. By the fall of 1986, Congress had voted to impose limited sanctions on South Africa.²⁵⁸ In vetoing these proposed sanctions, President Reagan argued that the sanctions would harm the blacks more than their white leaders.²⁵⁹ Despite this purported concern for the welfare of South Africa's blacks, strategic mineral dependence on South Africa remained an underlying foreign policy concern of the Reagan Administration.²⁶⁰

United States dependence on strategic minerals from countries like

253. Ungar & Vale, *supra* note 238, at 249; see also Jacoby, *supra* note 243, at 1080; Kennedy statement, *supra* note 252, at 3.

254. Ungar & Vale, *supra* note 238, at 249.

255. Jacoby, *supra* note 243, at 1081.

256. *Human Rights in Chile*, *supra* note 21, at 50 (statement of John Healey, Executive Director, Amnesty Int'l USA.). In 1984, Chile declared a state of siege as opposition to the Pinochet government increased. This resulted in mass arrests of citizens, raids on shantytowns and disappearances and banishments of hundreds of Chilean citizens. *Id.*

257. *National Emergency with Respect to South Africa, Message from the President of the United States Transmitting Notification of a Declaration of a National Emergency with Respect to South Africa, Pursuant to 50 U.S.C. 1703*, H.R. Doc. No. 103, 99th Cong., 1st Sess. 1 (1985). The trade restrictions included prohibition of bank loans to the South African government, export of computers and related technology to South Africa, nuclear exports to South Africa and imports of military goods made in South Africa. *Id.*

258. Sanctions imposed by the Anti-Apartheid Act of 1986 included a ban on imports of steel, iron, uranium, coal, Kruggerand coins, textiles and agricultural products. See 132 CONG. REC. H8661 (daily ed. Sept. 30, 1986). Although the sanctions affected approximately \$350 million worth of South African imports to the United States, the United States imported approximately \$2.2 billion worth of South African goods in 1985. See U.S. DEPT. OF COMMERCE, 1985 FOREIGN TRADE HIGHLIGHTS A-15 (1986); 132 CONG. REC. S14637 (daily ed. Oct. 2, 1986) (statement of Sen. Kassebaum).

259. See *Anti-Apartheid Act of 1986—Veto Message from the President of the United States*, 132 CONG. REC. H8648-49 (daily ed. Sept. 30, 1986).

260. In July 1986, after the House passed a bill requiring United States divestiture in South Africa, then White House Chief of Staff Donald Regan was quoted as saying, "[a]re the women of America prepared to give up all their jewelry? . . . Are we telling ourselves that industrial diamonds—things that we need for etching, cutting, shaping of tools and so forth—that we now have to go, if anywhere, to the Soviet Union?" L.A. Times, July 19, 1986, part I, at 13, col. 1. Donald Regan was also reported to have warned that imposition of sanctions would harm the United States because the United States depended on South Africa for manganese, platinum, rhodium, chromium and diamonds. *Id.* at col. 1. Regan's remarks prompted

South Africa and Chile might not be the ultimate factor that influences American foreign policy. However, United States concern over the availability of strategic minerals from a strategic mineral producing country is one factor decisionmakers weigh against human rights considerations when formulating United States foreign policy.

VII. ATTAINMENT OF U.S. STRATEGIC MINERAL POLICY GOALS: A PROPOSAL FOR CHANGE

The United States has had a strategic mineral policy for more than forty years; yet this country remains dependent on foreign imports of strategic minerals. The nation's quest for independence from foreign sources of strategic minerals has failed, not because it lacks a strategic mineral policy, but because this nation has failed to implement the strategic mineral policies it has adopted. The Mining and Minerals Policy Act of 1970 attempted to rectify the situation by expressly declaring a policy of mineral self-sufficiency.²⁶¹ Both the executive branch and the courts have ignored the 1970 Act.²⁶²

Rep. Stephen Solarz to comment: "What this proves is that the President's policy toward South Africa is all carat and no stick." L.A. Times, July 18, 1986, part I, at 10, col. 1-2.

Shortly before the Senate followed the House of Representatives in voting to override President Reagan's veto of the Anti-Apartheid Act, President Reagan sent Senate Majority Leader Robert Dole a letter concerning the sanctions against South Africa. 132 CONG. REC. S14659 (daily ed. Oct. 2, 1986) (letter to R. Dole from President Reagan (Sept. 29, 1986)). In his letter, President Reagan proposed imposing more restrictive measures against South Africa through an expanded executive order in lieu of congressionally enacted sanctions. The President's proposed restrictions included:

A requirement to report and make recommendations on means of reducing U.S. dependence on strategic minerals from southern Africa;

. . . .

A requirement to report on whether any of these prohibitions has had the effect of increasing U.S. or allied dependence on the Soviet bloc for strategic or other critical materials, with a view to appropriate modifications of U.S. measures under my Executive order should such dependency have been increased

Id. at S14660.

261. 30 U.S.C. § 21a (1982).

262. *See, e.g.,* Krueger v. Morton, 539 F.2d 235, 239-40 (D.C. Cir. 1976). An applicant for a coal prospecting permit was denied a permit after the Secretary of the Interior issued an order prohibiting the issuance of permits "in order to allow the preparation of a program for the more "orderly" development of coal resources upon the public lands of the United States under the Mineral Leasing Act, with proper regard for the protection of the environment." *Id.* at 237. The applicant challenged the ruling based in part on the argument that the Mining and Minerals Policy Act of 1970 directed the Secretary to "carry out a policy of fostering and encouraging the development of coal resources and that the order suspending the issuance of prospecting permits constituted an abuse of discretion in light of that Act" *Id.* The D.C. Circuit Court of Appeals held that the Secretary's order did not constitute an abuse of discretion under the MMPA. The court found no inconsistency between the Secretary's order and the purpose of the MMPA and noted that the suspension of the permits was not permanent.

On the other hand, the National Environmental Policy Act of 1969,²⁶³ which was passed by Congress a year before the Mining and Minerals Policy Act of 1970, has flourished and has become a major body of statutory law.²⁶⁴ National concern for the environment apparently has been of greater priority to the nation than its concern for its mineral supply. Similarly, national concerns over preservation of wilderness areas, solar energy and clean air have been given greater attention by Congress than the problem of national dependence on foreign sources of minerals.

The result is that one set of congressionally created national policy goals conflicts with other national goals.²⁶⁵ Concerns for clean air and alternative energy sources can have the effect of increasing demand for strategic minerals.²⁶⁶ Increased demand for strategic minerals required by alternative energy systems, used to reduce pollution, creates more mineral exploration and mining activities in the United States for domestically available minerals. Ironically, the result may be increased mining activity on public lands, and potential air and water pollution from mining and smelting activities. While the United States could import the minerals that it needs, increased importation would risk compromising national security and foreign policy decisions. Congress recognized this conflict of policies when it developed our strategic mineral policy over the past forty years.²⁶⁷ Unfortunately, the legislation enacted by Congress has not eliminated the danger of compromises. Unless national priorities are reorganized, it is unlikely that strategic mineral policy will ever become a serious issue.

Some objectives of U.S. strategic mineral policy could be achieved, however, if Congress coordinated them with other national priorities. These objectives would have to be attained through an integrated program implemented by the government over many years to reduce this nation's dependence on foreign strategic minerals.

Id. at 239-40. The court also noted that the Secretary, in his order, had stressed environmental considerations under the National Environmental Policy Act of 1969. *Id.* at 240-41.

263. 42 U.S.C. §§ 4321 *et seq.* (1982 & Supp. III 1985).

264. U.S. MINERALS VULNERABILITY, *supra* note 11, at 17.

265. *Id.* at 33.

266. *Id.* at 34 n.51. Demand for cleaner air has caused Congress to tighten emission standards for automobiles. Consequently, more rhodium and platinum must be imported to act as catalysts in automobile emission control systems. Gallium, an element needed in production of solar energy cells, may have to be imported from foreign sources in increasing amounts to meet growing domestic solar energy demands. *Id.*

267. See National Materials and Minerals Policy, Research and Development Act of 1980, 30 U.S.C. § 1603(8) (1982); National Critical Materials Act of 1984, 30 U.S.C. § 1803(a)(9) (Supp. III 1985).

This Comment proposes a series of short term and long term objectives designed to help reduce American dependence on strategic mineral imports. The objectives are presented by this Comment with other national goals in mind.

A. Short Term Objectives

1. Strategic mineral stockpile goals

The mineral requirements of the national strategic stockpile should vary with the relative scarcity of the stockpiled mineral. Some minerals—like silver—could be reduced from a three-year supply to a one-year supply because of their relative domestic abundance. Stockpiles of minerals like chromium, platinum and cobalt should be increased to at least five-year supplies so that the United States will have enough time to find substitutes, implement recycling programs and develop any available domestic resources. Shortages in chromium, platinum or cobalt could result from political upheavals or warfare in countries supplying these minerals. Increased stockpiles would help alleviate shortages and provide additional time for the affected exporting countries to resolve their problems and to resume mineral shipments.

2. Mineral surveys, recycling, and conservation

The USBM and USGS should jointly initiate domestic mineral exploration programs on lands withdrawn by Congress from mining under the General Mining Law. It is imperative that the United States have an accurate inventory of the minerals its lands contain. This goal can only be accomplished by recurring mineral surveys that incorporate the most recent geologic concepts and exploration techniques.²⁶⁸ By allowing only federal agencies to evaluate the land, environmental damage would be minimized because the number of explorationists examining the land would be limited to those supervised by the agency. Furthermore, the individuals examining the land would be directly accountable to the government for any damage to the environment.

Congress should not allow mining of any mineral reserves on withdrawn public lands unless there is a national emergency. In this way, the United States could catalog its domestic strategic mineral reserves without depleting them or conflicting with the policy goals of protecting the environment. Knowing the amount and locations of domestic strategic minerals that are available would greatly facilitate exploiting them in

268. See Bennethum & Lee, *supra* note 133, at 40, for a discussion of cursory mineral evaluations of wilderness areas and their problems.

times when severe shortages occur, since the early exploration phase of mineral development would already be completed.

Furthermore, the United States should require all mineral claimants and lessees on federal land to provide the USBM and USGS with all relevant geological, geophysical and geochemical data that they accumulate while engaging in prospecting on federal land. Exploration companies' concern over keeping their data confidential could be eased if the data were submitted to the government only after the claimants or lessees had relinquished their rights to the claims or leases.²⁶⁹ The data could also be restricted to internal government use for a fixed period of time before the government made the information available to the public. The United States needs to have more knowledge of the geology and mineral wealth of its public lands in order to more accurately assess its options in times of mineral shortages.

The federal government should actively encourage recycling and other conservation programs. Tax incentives or subsidies could foster greater recycling efforts by private industry. More government money should be spent on research and development in the field of materials substitution. The government should also continue funding current materials substitution projects to support the long term investment of time and money researchers need to complete such projects.

3. Import considerations

Because the United States will never be self-sufficient in many strategic minerals, it should diversify strategic minerals imports to avoid dependence on a small number of countries for the minerals that it needs. American money, technology and expertise in the field of mineral exploration and mining could induce developing countries to give the United States first priority in buying that country's minerals. By actively assisting developing nations to market their mineral wealth, the United States could be in an excellent position to receive a large share of the developing country's exports.

Until the nations of the world agree to uniform rules concerning seabed mining, it is unlikely that private industry will risk the time and money needed to mine the bottom of the sea. It is essential, therefore, that the United States either ratify the Law of the Sea Treaty or obtain worldwide consensus on a new set of principles governing seabed mining.

269. Compare with MINN. STAT. ANN. § 156A.071 subd. 9 (West Supp. 1987); WIS. STAT. ANN. § 107.15(4) (West Supp. 1986) (state statutes requiring disclosure of mineral exploration data to state).

The United States should implement a program to monitor imports and ascertain the amount of strategic minerals imported by the nation in the form of processed minerals and manufactured goods. The agency in charge of such a program should pay particular attention to which countries export the goods and what effect importing the goods will have on domestic manufacturing. Without accurate information on the effect that imported processed and manufactured goods containing strategic minerals have on the United States, Congress cannot successfully formulate an effective strategic mineral policy.

B. Long Term Objectives

1. Long term strategic mineral stockpile goals

The United States will have to spend at least one billion dollars per year for the next thirteen years to increase supplies of strategic minerals in the stockpile to levels that meet the three-year supply requirement of the Strategic and Critical Material Stockpiling Revision Act of 1979.²⁷⁰ One problem the federal government faces is where to find the money in a deficit-laden economy. Since strategic minerals have largely been a national defense concern,²⁷¹ this Comment suggests that the money should come from the defense budget.²⁷²

2. Long term mineral evaluations on public lands

Cataloging domestic mineral resources should be an ongoing process by the USBM and USGS. A moratorium should be placed on congressional and executive public land withdrawals from the General Mining Law until more comprehensive mineral surveys can be conducted on public lands. The nation needs more information on the mineral po-

270. OTA REPORT, *supra* note 9, at 6.

271. See, e.g., THE AILING DEFENSE INDUSTRIAL BASE: UNREADY FOR CRISIS, REPORT OF THE DEFENSE INDUSTRIAL BASE PANEL OF THE COMM. ON ARMED SERVICES, H.R. COMM. PRINT NO. 29, 96TH CONG., 2D SESS. (1980) (CIS No. H202-20 1980).

272. A detailed analysis of the defense budget is beyond the scope of this Comment. However, money could be obtained from the defense budget without affecting national security or increasing the budget deficit since the Congressional Budget Office has estimated that between 1983 and 1985 defense budgets were funded in excess of \$23.2 billion over what was necessary to cover rising costs due to inflation. CONG. OF THE UNITED STATES, CONG. BUDGET OFFICE, BUDGETING FOR DEFENSE INFLATION 1 (1986). Because Congress does not have accurate methods for accounting for these "inflation dividends," the location and use of this money often remains unknown. *Id.* at 21-23; see also J. EPSTEIN, THE 1987 DEFENSE BUDGET 51-52 (1986). This Comment suggests that Congress should develop accurate methods for accounting for overfunding of the defense budget and that it should use all or part of any excess appropriated funds for rebuilding the strategic mineral stockpile.

tential of its public lands before the lands are excluded from all mining activities.

3. Conservation projects

The federal government should initiate long term projects to find substitutes for strategic minerals. The projects should be carried out until fully developed into commercial ventures. Materials substitution research projects must be carried out to the point where substitutes are developed on a large scale manufacturing basis, not just in the laboratory. Unless the government can show private industry that material substitutes are cost effective in replacing strategic minerals in private industry's present manufacturing processes, it is unlikely that private industry will be willing to spend the money to develop the laboratory findings on a commercial manufacturing scale. Joint federal and private industry material substitution research programs would help assure that private industry would adopt the results of those programs, since private interests would then have a stake in the research and development of substitute materials.

Both the government and private industry should make recycling programs a part of their policy and should engage in research projects aimed at improving recycling technology. One incentive for encouraging recycling programs would be for the federal government to place tariffs on selected strategic minerals to make recycling programs more economically attractive. The effect of the tariff system, however, must be balanced with the United States' desire to encourage foreign countries to develop their strategic mineral resources and to sell their minerals to the United States.

4. The future of seabed mining

Because of the expense and risk involved in recovering minerals from the sea floor, the federal government should subsidize the development of a seabed mining industry. Private industry and the government should engage in joint programs to develop the technology needed to economically mine deep sea minerals. Government participation in such projects could also help expedite mining activities, since mining companies may have to deal with an international organization to obtain the necessary permits to engage in sea floor mining.²⁷³ It is also important that the federal government monitor all phases of seabed mining of stra-

273. See Richardson, *supra* note 208, at 2-3.

tegic minerals to effectively reevaluate its strategic mineral policy as the minerals are extracted from the seabed.

5. Mining in Outer Space

The recovery of mineral resources in outer space may be another alternative open to the United States during the next century. However, in addition to the formidable technological and financial obstacles to mining the moon, asteroids, and other planets, there also may be legal ones. The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies²⁷⁴ states that "[t]he exploration and use of outer space, including the moon and other celestial bodies . . . shall be the province of all mankind."²⁷⁵ Additionally, the activities of all state parties to the Treaty in the exploration and use of outer space including the moon and other celestial bodies must be done in accordance with international law.²⁷⁶ Because the United States is a party to this Treaty, it may not be able to exploit mineral resources in outer space without adhering to international rules and regulations. This situation appears to be similar to the one that the Reagan Administration has sought to avoid in the Law of the Sea Treaty.²⁷⁷ Thus, unless the United States is willing to conduct its outer space mining activities in accordance with international law, it may not be able to utilize this option to reduce its strategic mineral vulnerability.

6. The future of American strategic mineral processing and manufacturing industries

The United States should also consider subsidizing critical industries in the United States that are responsible for manufacturing goods and materials from strategic minerals where such industries are experiencing hardship as a result of foreign competition. While tariffs on imports of certain manufactured goods made from strategic minerals may

274. Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205.

275. Art. I, 18 U.S.T. 2410, 2412, T.I.A.S. No. 6347, 610 U.N.T.S. 207, 207-08. This language in the Treaty resembles that used in the Law of the Sea Treaty which describes seabed resources as the "common heritage of mankind." *See supra* note 210. Thus, the language of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space appears to contradict the Reagan Administration's view that mineral resources beyond territorial boundaries belong to no country or individual but are open to those with the capability of exploiting them. *See id.*

276. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, art. III, Jan. 27, 1967, 18 U.S.T. 2410, 2413, T.I.A.S. No. 6347, 610 U.N.T.S. 205, 208.

277. *See supra* notes 203-13 and accompanying text.

not be the best answer, Congress could adopt less antagonistic measures. Such measures might include low interest loans and tax incentives to help the industry modernize and become more competitive.²⁷⁸ Without the continued existence of key industries such as the ferroalloys industry in the United States, it will be impossible for the United States, in times of crisis, to make the materials it needs from strategic minerals even if the minerals are available in the nation's stockpile. A strategic mineral policy which ignores this important factor is likely to fail in a national emergency.

VIII. CONCLUSION

The United States is in need of an effective strategic mineral policy. Without one, our national security is threatened and our foreign policy is rendered confusing and hypocritical. American strategic mineral policy is important not just for developing adequate future supplies of strategic minerals; it is also important for preserving our role as a world leader. Without an effective strategic mineral policy, the United States will always be vulnerable to embargo threats or price hikes from countries which hold a monopoly on the strategic minerals this country needs for both military and civilian uses. This form of blackmail could cause the United States to adopt a foreign policy that is inconsistent with our democratic principles. In particular, our policy toward human rights in other countries may be especially vulnerable to pressures exerted by a strategic mineral producing country that provides the United States with nearly all its needs for a particular strategic mineral.

Unless U.S. strategic mineral vulnerability is alleviated, it will continue to be a factor weighed by Congress and the President against human rights considerations. As a result, United States foreign policy may be unnecessarily skewed toward geopolitical rather than humanitarian concerns. Without a consistent policy toward human rights, the United States is in danger of losing its credibility as a world leader. Without the influence of a moral world leader such as the United States, worldwide suppression of human rights may go unchallenged and un-

278. *Geopolitics*, *supra* note 21, at 126 (discussing use of break-point pricing for ferroalloys). Under a system of break-point pricing, the cost of a particular imported good would have to be the same price as the same goods manufactured in the United States by the most efficient domestic producers. Any imports that are below this price would be assessed a tariff penalty by the United States. *Id.* The result may be less restrictive on foreign imports than a pure tariff system because imports at or above the break-point price would not have a tariff imposed on them. Furthermore, American producers who were not as efficient as their domestic competition would either be forced to become more competitive or would have to close down their operations. *Id.*

checked. Terrorism may increase as the only means available to oppressed people to counter suppression of human rights.

Because supplies of strategic minerals are dependent on many complex factors, it will take years for the United States to significantly reduce its dependence on foreign imports. Therefore, it is essential that stronger legislation be enacted by Congress as soon as possible, and that current strategic mineral policy be implemented and followed immediately by both the executive and legislative branches. It is even more important, however, that both Congress and the President commit themselves to such a policy.

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